

Exhibit 8

1 UNITED STATES DISTRICT COURT
2 DISTRICT OF NEW JERSEY
3 MDL NO. 16-2738(MAS)(RLS)

4 -----
5 IN RE: JOHNSON & JOHNSON
6 TALCUM POWDER PRODUCTS
7 MARKETING, SALES PRACTICES,
8 AND PRODUCTS LIABILITY LITIGATION.
9 -----

10 SUPERIOR COURT OF NEW JERSEY
11 LAW DIVISION - MIDDLESEX COUNTY
12 DOCKET NO. MID-L-003809-18AS
13

14 KAYME A. CLARK and
15 DUSTIN W. CLARK,

16 Plaintiffs,

17 v.

18 JOHNSON & JOHNSON, et al.,
19 Defendants.
20 -----
21
22
23
24
25

DEPOSITION UPON
ORAL EXAMINATION
OF
SHU-CHUN SU
(VOLUME II)

<p style="text-align: right;">Page 191</p> <p>1 TRANSCRIPT of the stenographic notes 2 of ANDREA F. NOCKS, a Certified Court Reporter and 3 Certified Realtime Court Reporter of the State of 4 New Jersey, Certificate No. XI01573, taken at THE 5 HELDRICH HOTEL, 10 Livingston Avenue, New Brunswick, 6 New Jersey, on Thursday, July 18, 2024, commencing 7 at 9:12 a.m., Eastern Standard Time. 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25</p>	<p style="text-align: right;">Page 193</p> <p>1 A P P E A R A N C E S: 2 BEASLEY, ALLEN, CROW, METHVIN, PORTIS & MILES 3 BY: LEIGH O'DELL, ESQ. (VIA ZOOM) 4 218 Commerce Street Montgomery, Alabama 36104 5 Attorneys for MDL Plaintiffs 6 7 8 9 REILLY, McDEVITT & HENRICH, P.C. BY: KEVIN KOTCH, ESQ. 10 (VIA ZOOM) 3 Executive Campus 11 Suite 310 Cherry Hill, New Jersey 08002 12 Attorneys for Defendant, Personal Care Products Council 13 14 15 16 17 18 19 20 21 22 23 24 25</p>
<p style="text-align: right;">Page 192</p> <p>1 A P P E A R A N C E S: 2 DEAN OMAR BRANHAM SHIRLEY LLP BY: BENJAMIN BRALY, ESQ. 3 302 North Market Street Suite 300 4 Dallas, Texas 75202 Attorneys for Plaintiffs 5 6 7 8 KING & SPALDING BY: KEVIN HYNES, ESQ. 9 1185 Avenue of the Americas 34th Floor 10 New York, New York 10036 -AND- 11 McCARTER & ENGLISH BY: JOHN C. GARDE, ESQ. 12 Four Gateway Center 100 Mulberry Street 13 Newark, New Jersey 07102 Attorneys for Defendant, 14 Johnson & Johnson 15 16 17 18 COHEN PLACITELLA & ROTH BY: CHRISTOPHER M. PLACITELLA, ESQ. 19 (VIA ZOOM) 127 Maple Avenue 20 Red Bank, New Jersey 07701 Attorneys for MDL Plaintiffs 21 22 23 24 25</p>	<p style="text-align: right;">Page 194</p> <p>1 INDEX 2 PAGE 3 WITNESS: 4 SHU-CHUN SU 5 EXAMINATION BY: 6 MR. BRALY 197,305 7 MR. PLACITELLA 260,321 8 MR. HYNES 287 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25</p>

<p style="text-align: right;">Page 195</p> <p>1 E X H I B I T S</p> <p>2 NUMBER DESCRIPTION IDENTIFICATION</p> <p>3 34 A Rapid and Accurate</p> <p>4 Procedure for the Determination</p> <p>5 of Refractive Indices of</p> <p>6 Regulated Asbestos Minerals 204</p> <p>7 35 September 9, 2016</p> <p>8 NVLAP On-Site Assessment 207</p> <p>9 36 NVLAP evaluation 208</p> <p>10 37 2005 abstract 216</p> <p>11 38 The Unification of Becke line</p> <p>12 and Dispersion Staining</p> <p>13 Techniques for the Determination</p> <p>14 of Refractive Index of</p> <p>15 Non-Opaque Materials 219</p> <p>16 39 Asbestos Identification,</p> <p>17 Walter McCrone 225</p> <p>18 40 Michel-Levy color chart</p> <p>19 example 227</p> <p>20 41 October 5, 2023, TEM analysis</p> <p>21 of length dispersions of</p> <p>22 sample Calidria 236</p> <p>23 42 Wet_Sieved_Talc_SG-210_1000_SE_ETD</p> <p>24 Image 256</p> <p>25</p>	<p style="text-align: right;">Page 197</p> <p>1 S H U - C H U N S U ,</p> <p>2 having been previously duly sworn, testifies as</p> <p>3 follows:</p> <p>4 CONTINUED DIRECT EXAMINATION BY MR. BRALY:</p> <p>5 Q. How are you?</p> <p>6 A. I'm fine.</p> <p>7 Q. Good to see you again.</p> <p>8 A. Good to see you again.</p> <p>9 Q. I said no, but it is actually kind of</p> <p>10 an important point.</p> <p>11 You understand that you are still</p> <p>12 under oath from the last time?</p> <p>13 A. Understood.</p> <p>14 Q. Great. So you're going to tell me</p> <p>15 the truth?</p> <p>16 A. Yes.</p> <p>17 Q. Good; 'cause otherwise, we would have</p> <p>18 a real problem.</p> <p>19 A. Sure.</p> <p>20 Q. Have you conducted any additional</p> <p>21 analytical experimentation or evaluation of the</p> <p>22 issues pertaining to either the Clark case or the</p> <p>23 MDL case since our last deposition?</p> <p>24 A. No.</p> <p>25 Q. Okay. I want to talk to you a little</p>
<p style="text-align: right;">Page 196</p> <p>1 E X H I B I T S C O N T ' D</p> <p>2 NUMBER DESCRIPTION IDENTIFICATION</p> <p>3 43 Wet_Sieved_Talc_SG-210_6500_SE_ETD</p> <p>4 Image 258</p> <p>5 44 J4-1 method 259</p> <p>6 45 Four tables 304</p> <p>7 46 One-page handwritten note,</p> <p>8 Post-Its on Exhibit 32 304</p> <p>9</p> <p>10</p> <p>11</p> <p>12 REQUEST FOR PRODUCTION</p> <p>13 PAGE 256...Value data</p> <p>14</p> <p>15</p> <p>16</p> <p>17</p> <p>18</p> <p>19</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p>	<p style="text-align: right;">Page 198</p> <p>1 bit about the Becke line method of refractive index</p> <p>2 calculation. Okay?</p> <p>3 A. Okay.</p> <p>4 Q. It is a true statement that the</p> <p>5 dispersion staining method is a method to determine</p> <p>6 the refractive index of a particle, correct?</p> <p>7 A. Is what method?</p> <p>8 Q. That's a true statement, that it is a</p> <p>9 method?</p> <p>10 A. One of the methods.</p> <p>11 Q. Yes.</p> <p>12 There's another method that's called</p> <p>13 the Becke line method for determining the refractive</p> <p>14 index of a particle, correct?</p> <p>15 A. Correct.</p> <p>16 Q. What I gathered from our last meeting</p> <p>17 was that you are taking the position that when you</p> <p>18 do dispersion staining, when you're looking at the</p> <p>19 colors under the polarizer, that you have to switch</p> <p>20 the objective to the Becke setting and evaluate</p> <p>21 where on the particle the Becke line matches the</p> <p>22 refractive index fluid, or most closely matches the</p> <p>23 refractive index fluid?</p> <p>24 A. I should say it is not to find the</p> <p>25 Becke line matches the color, it is to find out</p>

<p style="text-align: right;">Page 199</p> <p>1 where is the true Becke line and the dispersion 2 staining color. 3 Q. Okay. 4 A. The dispersion staining color, they 5 are corresponding. Like you say, you have a series, 6 a range of the color, dispersion staining color. 7 Now, which one is the one we're presenting the true 8 "refract" index. You would have to switch the Becke 9 line to examine the Becke line characteristics to 10 determine which color -- 11 Q. Okay. 12 A. -- is present in the true refract 13 index. 14 Q. So, when you say you have to switch, 15 you're talking about switching the setting in the 16 objective, which is a piece of the microscope? 17 A. That's right. 18 Q. To remove what's called the central 19 stop? 20 A. That's right. 21 Q. Right. 22 What you're describing is not the 23 Becke line method of determining the refractive 24 index 'cause that's a completely separate 25 methodology, right? It's using the Becke line</p>	<p style="text-align: right;">Page 201</p> <p>1 line method? 2 A. Could you say question again? 3 Q. Yes. 4 A. Please. 5 Q. Nowhere in your report do you discuss 6 utilizing the Becke line method to confirm or to 7 critique the analysis that Dr. Longo performed in 8 his dispersion staining analysis? 9 A. I don't have to, because he said he's 10 a self-taught polarized light microscopy expert. 11 Any expert should know that. It's, like, common 12 knowledge. Yeah. 13 I only said his determination using 14 the dispersion staining technique is incorrect. 15 Q. Where he takes the color based -- 16 A. That's right. I don't have to point 17 out where he's incorrect. Okay. 18 Q. No, no, no. I get it. You think 19 he's wrong, you're saying that you don't have to 20 point out exactly how he's wrong. 21 A. That's right. 22 Q. And of course, Dr. Longo is taking 23 the position, I suppose, that the color at the edge, 24 or the border of the fluid and the particles where 25 you should be reviewing the coloring, you think</p>
<p style="text-align: right;">Page 200</p> <p>1 setting to help confirm the dispersion staining 2 method? 3 A. No. So-called, the Becke line 4 setting is in order to observe the Becke line, like 5 the dispersion staining setting is for the observing 6 the dispersion staining color. You see? The 7 setting and the method, it's part of method, it's 8 not just change the setting; it change the test 9 method. 10 Q. So, when you perform this, when you 11 switch the objective from central stop to the Becke 12 setting, or the no-stop setting, I suppose is what 13 it is -- 14 A. Um-hum. 15 Q. -- are you saying that you're 16 utilizing a completely separate method to confirm 17 the other method? 18 A. That's right. 19 Q. I did a review of your entire report, 20 the report that you issued in May, and the word 21 "Becke" appears twice, and they're both in your 22 article list, your list of references. 23 You would agree that nowhere in your 24 report do you provide a criticism of Dr. Longo 25 relative to some supposed failure to use the Becke</p>	<p style="text-align: right;">Page 202</p> <p>1 that's wrong? 2 A. Now you mention color. Let me make 3 it clear, color does not identify mineral, does not 4 identify any mineral, including asbestos mineral. 5 Color is not a intrinsic property. 6 Q. I understand. 7 A. Refract index is. You see, there's 8 no literature, no methods, whether EPA, ISO or ASTM, 9 they identify, describe, asbestos by color. Okay? 10 Q. But that's not what I asked you. 11 A. No, no, no. I want make -- because 12 I -- 13 Q. I want you to answer my question. 14 A. Yes. That's what I'm answering, the 15 color question. 16 Q. You're not. I know the color 17 corresponds to wavelength. I know this. That's not 18 what I'm asking you. 19 A. What wavelengths? 20 Q. Yeah. 21 A. What wavelengths? 22 Q. That you can take the color and 23 compare it to a chart that you've developed to 24 determine a range of wavelengths -- 25 A. What wavelengths, the question is.</p>

<p style="text-align: right;">Page 203</p> <p>1 This a very central issue of this debate.</p> <p>2 Q. I'm not debating with you.</p> <p>3 A. No, no, no, no. A discussion, the</p> <p>4 central --</p> <p>5 Q. Doctor, please. I'm just asking you</p> <p>6 questions.</p> <p>7 A. Yes.</p> <p>8 Q. I'd appreciate if you'd focus on the</p> <p>9 question I'm asking.</p> <p>10 A. I am focusing on the question.</p> <p>11 MR. HYNES: Let him finish the</p> <p>12 question.</p> <p>13 BY MR. BRALY:</p> <p>14 Q. Let's start over.</p> <p>15 All I was trying to get at is that</p> <p>16 Dr. Longo evaluates the image at the border of where</p> <p>17 the fluid and the particle are coming together, at</p> <p>18 least that's what he said, and you disagree with</p> <p>19 that as a methodology for identifying what it is</p> <p>20 that he's looking at?</p> <p>21 A. No, I'm not disagreeing with that. I</p> <p>22 said his methodology is wrong; he was not correctly</p> <p>23 performing the technique.</p> <p>24 Q. Okay. One of the ways that he was</p> <p>25 not correctly performing the technique is because he</p>	<p style="text-align: right;">Page 205</p> <p>1 I take it you're familiar with this?</p> <p>2 A. Yes, that's my paper.</p> <p>3 Q. Yes.</p> <p>4 In this paper, you do not discuss</p> <p>5 using Becke lines or the Becke line method to</p> <p>6 confirm what you're looking at by dispersion</p> <p>7 staining, correct?</p> <p>8 A. I don't have to.</p> <p>9 Q. Just answer my question.</p> <p>10 A. Yes, I did not, because I don't have</p> <p>11 to. Okay.</p> <p>12 Q. So, for an analyst or somebody</p> <p>13 reviewing the peer-reviewed literature, they would</p> <p>14 have no idea based on this paper from 2003 that you</p> <p>15 believe that you should confirm what they're seeing</p> <p>16 by dispersion staining by doing a Becke line</p> <p>17 analysis?</p> <p>18 MR. HYNES: Calls for speculation.</p> <p>19 THE WITNESS: Can I answer the</p> <p>20 question?</p> <p>21 MR. HYNES: Yeah, you can answer the</p> <p>22 question.</p> <p>23 A. If a analyst using the dispersion</p> <p>24 staining technique to determine a refract index, if</p> <p>25 he is a trained analyst, he should know how do you</p>
<p style="text-align: right;">Page 204</p> <p>1 didn't utilize this objective switch to the --</p> <p>2 A. No, no, no. I never --</p> <p>3 Q. Let me finish my question.</p> <p>4 A. Okay. Sorry.</p> <p>5 Q. One of the ways that you believe he</p> <p>6 was incorrect is because he didn't follow the</p> <p>7 methodology of switching to no-stop in evaluating</p> <p>8 where the Becke line was?</p> <p>9 A. No, I'm not saying that. I'm saying</p> <p>10 that -- I said he is incorrectly performing the</p> <p>11 dispersion staining technique; I didn't say he did</p> <p>12 not switch. Because it's not tutorial. I don't</p> <p>13 have to tell him what -- how to -- what's the</p> <p>14 correct way to performing the technique.</p> <p>15 Q. I have a series of articles that you</p> <p>16 published that I want to talk to you about briefly.</p> <p>17 A. Okay.</p> <p>18 Q. Like before, let me get set up.</p> <p>19 Exhibit 34 is going to be an article</p> <p>20 that you published in "American Mineralogist" in</p> <p>21 2003 --</p> <p>22 A. Yeah.</p> <p>23 Q. -- called "A Rapid and Accurate</p> <p>24 Procedure for the Determination of Refractive</p> <p>25 Indices of Regulated Asbestos Minerals."</p>	<p style="text-align: right;">Page 206</p> <p>1 need to distinguish the normal dispersion staining</p> <p>2 color from the distorted dispersion staining color.</p> <p>3 And he should know, in many cases he's trained, he</p> <p>4 should use the other method to distinguish that,</p> <p>5 which Becke line is the most effective method.</p> <p>6 Q. Have you ever published that a</p> <p>7 dispersion staining analysis should be coupled with</p> <p>8 a Becke line analysis in order to confirm what it is</p> <p>9 that's being looked at by dispersion staining?</p> <p>10 A. No, I don't have to. Okay.</p> <p>11 Q. You don't have to because you presume</p> <p>12 people should know if they're well-trained and run a</p> <p>13 good lab?</p> <p>14 A. Not well-trained. If you are</p> <p>15 trained, you should know because Becke line is the</p> <p>16 first technique to determine refract index.</p> <p>17 Dispersion staining technique came later in 1930s,</p> <p>18 okay, but Becke line was developed way before that.</p> <p>19 Anyone who is a trained analyst using polarized</p> <p>20 light microscopy determine by refract index should</p> <p>21 know that, should know both technique, and should</p> <p>22 know when do you use the technique to confirm each</p> <p>23 other.</p> <p>24 Q. Okay. In your work for NVLAP,</p> <p>25 N-V-L-A-P -- your work for NVLAP, you accredited --</p>

<p style="text-align: right;">Page 207</p> <p>1 you personally accredited MAS as a PLM laboratory</p> <p>2 that performed PLM analysis in ways that were in</p> <p>3 accordance with standards?</p> <p>4 A. No.</p> <p>5 Q. You did not?</p> <p>6 A. I did outside assessment. I don't</p> <p>7 have the power to accredit any laboratory. NVLAP,</p> <p>8 they have the power. I only report. My assessment</p> <p>9 is either determination whether they received</p> <p>10 accreditation or not. It was NVLAP; it's not me. I</p> <p>11 don't have that power.</p> <p>12 Q. Exhibit 35 is a document dated</p> <p>13 September 9, 2016, titled at the top "NVLAP On-Site</p> <p>14 Assessment."</p> <p>15 Do you see that?</p> <p>16 A. Yeah.</p> <p>17 Q. That's your signature on the bottom</p> <p>18 right?</p> <p>19 A. Correct.</p> <p>20 Q. What were you doing here?</p> <p>21 A. I did the -- I follow the protocol,</p> <p>22 NVLAP protocol, to assess the managerial and</p> <p>23 technical management of the laboratory, which now</p> <p>24 for this one is MAS. I'm assessing whether they are</p> <p>25 capable of following, to comply with the managerial</p>	<p style="text-align: right;">Page 209</p> <p>1 A. Yeah.</p> <p>2 Q. Okay. So, in 2016 this is the</p> <p>3 evaluation that you conducted at MAS, correct?</p> <p>4 A. Correct.</p> <p>5 Q. And my colleague, Mr. Placitella,</p> <p>6 would tell me this is God's way of telling me I've</p> <p>7 been talking too much.</p> <p>8 It includes -- again, back to</p> <p>9 Exhibit 36, it includes on page 2 a section on</p> <p>10 proficiency testing, correct?</p> <p>11 A. Page 2, yeah, proficient test, yes.</p> <p>12 Yep.</p> <p>13 Q. Actually, it was the other document I</p> <p>14 was pointing to.</p> <p>15 A. Yes.</p> <p>16 Q. And you conducted proficiency testing</p> <p>17 of MAS in 2016 specific to the way they were doing</p> <p>18 the PLM?</p> <p>19 A. Let me make it clear: The proficient</p> <p>20 testing -- proficiency testing in the 3.4 clause is</p> <p>21 not what I did in the lab. That proficient testing</p> <p>22 is a formal testing issued by NVLAP twice a year,</p> <p>23 like M1 2015, M2 2016. This testing, you see the</p> <p>24 title --</p> <p>25 Q. I wasn't asking you about that</p>
<p style="text-align: right;">Page 208</p> <p>1 requirement and technical requirement set out by</p> <p>2 NVLAP. That's my job.</p> <p>3 Q. And you were performing this</p> <p>4 analysis -- you were performing this analysis on</p> <p>5 behalf of NVLAP?</p> <p>6 A. Assessment.</p> <p>7 Q. Right?</p> <p>8 A. Yeah. Yes.</p> <p>9 Q. I mean, you don't take this lightly,</p> <p>10 do you?</p> <p>11 A. No.</p> <p>12 Q. There is an error in this, the</p> <p>13 attached -- if you'll flip through them, it's</p> <p>14 missing, I think, pages 14, and I think another</p> <p>15 page. I have another exhibit that I can get for</p> <p>16 you.</p> <p>17 A. Which, page 14?</p> <p>18 Q. If you'll flip through it, there's 17</p> <p>19 pages attached to it. You'll see --</p> <p>20 A. No, the even page was missing. You</p> <p>21 want to print it --</p> <p>22 Q. I'm saying I have the full thing. I</p> <p>23 am just marking -- here you go. (Handing.)</p> <p>24 This will be Exhibit 36. It's the</p> <p>25 full list of the evaluation from NVLAP.</p>	<p style="text-align: right;">Page 210</p> <p>1 document. I wasn't asking you about that document.</p> <p>2 MR. HYNES: Let him finish the</p> <p>3 answer, please.</p> <p>4 A. But you're asking the testing I did.</p> <p>5 Q. No, I didn't. I asked you on page 2,</p> <p>6 it lists requirements for --</p> <p>7 A. Okay.</p> <p>8 Q. Let's try to stick to the question</p> <p>9 I'm asking.</p> <p>10 A. Okay.</p> <p>11 Q. I said on page 2, it lists</p> <p>12 proficiency testing.</p> <p>13 A. Correct.</p> <p>14 Q. Okay. If we go to page 7 of</p> <p>15 Exhibit 36, page 7 of 17 --</p> <p>16 A. Page 6?</p> <p>17 Q. Seven.</p> <p>18 A. Seven? Okay.</p> <p>19 Q. Section 5.3 there's a section called</p> <p>20 "Accommodation and Environmental Conditions,"</p> <p>21 correct?</p> <p>22 A. Yes.</p> <p>23 Q. And the Section 5.3.2 talks about</p> <p>24 "The laboratory shall have procedures for the use of</p> <p>25 blanks and asbestos-free material to determine the</p>

<p style="text-align: right;">Page 211</p> <p>1 presence, quantity, and consistency of asbestos 2 contamination in their analytical processes and have 3 related procedures to control it." 4 Do you see that? 5 A. Yes, I do. 6 Q. And you evaluated this in 2016 as 7 "ok," correct? 8 A. Correct. 9 Q. Which means it passes? 10 A. Correct. 11 Q. For NVLAP certification? 12 A. Correct. 13 Q. And that's something you evaluated 14 personally? 15 A. But not about accreditation. As I 16 said, I only evaluate following this checklist. 17 NVLAP has the power to determine whether they pass 18 or not. 19 Q. This was the -- so when it says "ok" 20 here, that was based on the information that you 21 reported to NVLAP, correct? 22 A. Correct. 23 Q. Right. 24 And they said they passed? 25 A. What I'm saying, the "ok" here only</p>	<p style="text-align: right;">Page 213</p> <p>1 calibration methods. 2 Do you see that? 3 A. I see that. 4 Q. What does the letter C mean in this 5 analysis? 6 A. Comments. 7 Q. Okay. Do you know where the comments 8 are? 9 A. Yes. I said 5.9.1, I think they 10 comply with this requirement from minimum 10 percent 11 QA, and listed here QA rate. The QA rate by this 12 lab meet -- meets this minimum 10 percent 13 requirement. Comments in the NVLAP system, comment 14 is not a nonconformity; it is only document the 15 assessor's observation, okay? Yeah. 16 So, comments is not criticism, what 17 I'm saying is, just to show what the lab did is 18 correct. 19 Q. So the comments are your actual 20 comments from your review at MAS in 2016? 21 A. Yes. 22 Q. So, when we get to 5.9.5, which is 23 found at page 14 of 17, Section -- I'm sorry. 24 A. 14, yes. 25 Q. 5.9.5.</p>
<p style="text-align: right;">Page 212</p> <p>1 means they are in -- complied with this requirement; 2 NVLAP said whether they pass or not. 3 Q. Okay. Go to the next page, page 8. 4 A. Okay. 5 Q. Test and calibration methods in 6 method validation 5.4.1: "The laboratory shall use 7 the US EPA interim method for the determination of 8 asbestos in bulk insulation samples." That's found 9 at 40 CFR Part 763. 10 Do you see that? 11 A. Yes, I do. 12 Q. Again, you performed this evaluation? 13 A. Yes, I did. 14 Q. And NVLAP okayed it, correct? 15 A. That's right. NVLAP okayed it. 16 Q. Based on the information you reported 17 back to them? 18 A. Correct. 19 Q. Okay. Go to page 13 of 17. 20 A. 13? 21 Q. Yes. 22 A. Okay. 13. 23 Q. There's a section called "5.9"? 24 A. Correct. 25 Q. Assuring the quality of test and</p>	<p style="text-align: right;">Page 214</p> <p>1 A. Yep. 2 Q. The section is labeled "The 3 laboratory shall maintain and summarize all of the 4 quality assurance activities at least monthly to 5 include..." and then it includes the list of things 6 to include, correct? 7 A. Correct. 8 Q. One of those is, under I, is the 9 total qualitative error rate of the laboratory. 10 You see that? 11 A. Yes, I saw that. 12 Q. On the last page for comments, you 13 marked "Monthly Summary: Well Done." 14 A. Yes. 15 Q. Okay. You were there specifically to 16 determine MAS's compliance against a NVLAP checklist 17 pertaining to their PLM methodology, the way they 18 run their lab? 19 A. Correct. 20 Q. And NVLAP passed them, correct? 21 A. Correct. 22 Q. Based on the information you reviewed 23 and provided to them and signed your name to? 24 A. More so based on the reviewer. The 25 NVLAP procedure is such. They sent a assessor to</p>

<p style="text-align: right;">Page 215</p> <p>1 the lab informing the lab how the assessor's 2 biography. The lab get to determine whether they 3 accept this assessor or not. So, when they accept 4 assessor, the assessor comes to the lab to do the 5 assessment, then turn in the assessment report like 6 what I did.</p> <p>7 However, there's one more step. The 8 NVLAP will assign another assessor to review the 9 report. If the review report is okay, then NVLAP 10 determine whether they will grant the accreditation 11 or not. So, it's based on not only my report, but a 12 second step, that the reviewer's review.</p> <p>13 Q. Okay. So somebody reviewed the 14 information you provided?</p> <p>15 A. Correct.</p> <p>16 Q. And NVLAP approved MAS with regard to 17 their PLM microscopy?</p> <p>18 A. Correct.</p> <p>19 Q. I want to turn back to the Becke line 20 discussion briefly.</p> <p>21 A. Okay.</p> <p>22 Q. If I understand it correctly, you 23 agree that your report in no place discusses the 24 application of a Becke line methodology to 25 dispersion staining analysis, but you believe that</p>	<p style="text-align: right;">Page 217</p> <p>1 Q. What it says in the first paragraph 2 is, "Although both Becke line and dispersion 3 staining can be used to determine refractive index 4 of a solid immersed in an immersion oil, dispersion 5 staining has several advantages complementary to the 6 Becke line method that makes it a versatile 7 alternative technique for refractive index 8 determination using the immersion method," correct?</p> <p>9 A. Correct.</p> <p>10 Q. You're identifying dispersion 11 staining as a completely separate technique for 12 determining refractive indices, correct?</p> <p>13 A. Correct. It's not me to decide, to 14 determine what it is because, in fact, it is one of 15 the method to determine refract index.</p> <p>16 Q. So, going to Exhibit 13 -- do you 17 have it in front of you?</p> <p>18 A. Yes.</p> <p>19 Q. Okay. Great.</p> <p>20 So, going to Exhibit 13, if you'll 21 turn to -- it's paginated as page 53.</p> <p>22 A. Okay.</p> <p>23 Q. Yeah.</p> <p>24 A. 53. Yes?</p> <p>25 Q. And this is a 2022 article that you</p>
<p style="text-align: right;">Page 216</p> <p>1 people should just know that if they're a quality 2 PLM analyst?</p> <p>3 A. Which report? You mean my MDL 4 report?</p> <p>5 Q. The only report you've issued in this 6 case.</p> <p>7 A. Okay. Yes.</p> <p>8 Q. That's Exhibit 3 to this deposition.</p> <p>9 A. Okay.</p> <p>10 Q. In your published papers, and I could 11 show you examples of this if you'd like, you refer 12 to dispersion staining and a Becke line analysis as 13 two competing ways to determine the refractive index 14 of a mineral, correct?</p> <p>15 A. Incorrect.</p> <p>16 Q. Okay.</p> <p>17 A. I never said they are competing. 18 Actually, they work in concert.</p> <p>19 Q. I'm going to hand you an abstract 20 from 2005 that you published.</p> <p>21 A. Yes.</p> <p>22 Q. And this will be Exhibit 37. Let me 23 get this taken care of.</p> <p>24 Are you familiar with this abstract?</p> <p>25 A. Yes.</p>	<p style="text-align: right;">Page 218</p> <p>1 published, I believe in "The Microscope," correct?</p> <p>2 A. Correct.</p> <p>3 Q. At the top of page 53 you state, 4 "There are three common techniques for assessing the 5 sign and magnitude of the match/mismatch between a 6 solid and its surrounding liquid: Becke line, 7 dispersion staining, and oblique illumination. Only 8 the dispersion staining can meet the above specific 9 needs for the routine PLM analysis of bulk asbestos 10 samples in commercial environmental laboratories."</p> <p>11 That's what you wrote in 2022, 12 correct?</p> <p>13 A. Correct.</p> <p>14 Q. You do not write anywhere in this 15 paper that the Becke line method can confirm where 16 an analyst should be looking on a particle to 17 determine the reference to analyze, correct?</p> <p>18 A. Correct.</p> <p>19 Q. In fact, this paragraph is the only 20 time Becke is mentioned in that -- in this entire 21 document?</p> <p>22 A. Correct.</p> <p>23 Q. Last year, in 2023, you published an 24 article entitled "The Unification of Becke line and 25 Dispersion Staining Techniques for the Determination</p>

<p style="text-align: right;">Page 219</p> <p>1 of Refractive Index of Non-Opaque Materials,"</p> <p>2 correct?</p> <p>3 A. Correct.</p> <p>4 Q. Do you remember when this was</p> <p>5 published in 2023?</p> <p>6 A. I forgot which month.</p> <p>7 Q. This will be Exhibit 38.</p> <p>8 So, in this paper from 2023, if you'd</p> <p>9 turn to the third page, which is page 101 --</p> <p>10 A. Yes.</p> <p>11 Q. -- we see the three objective</p> <p>12 settings.</p> <p>13 A. Correct.</p> <p>14 Q. Central stop, annular stop, and then</p> <p>15 no -- no stop, or regular objective, correct?</p> <p>16 A. Correct.</p> <p>17 Q. This is the first published paper</p> <p>18 that I have seen from you that illustrates all three</p> <p>19 settings as opposed to just central stop and annular</p> <p>20 stop, correct?</p> <p>21 A. Correct.</p> <p>22 Q. If we continue in this paper to page</p> <p>23 108 --</p> <p>24 A. Yes.</p> <p>25 Q. -- there is a series of images which</p>	<p style="text-align: right;">Page 221</p> <p>1 Q. Figure 9 are three separate images of</p> <p>2 what an analyst can find when conducting a Becke</p> <p>3 line analysis, correct?</p> <p>4 A. That's right.</p> <p>5 Q. And then if you'll turn to page 112,</p> <p>6 in the acknowledgments, you state, "The critical</p> <p>7 contributions from Professor Emeritus Mickey Gunter,</p> <p>8 University of Idaho, especially the superb suites of</p> <p>9 Becke line and dispersion staining colors at various</p> <p>10 matching wavelengths that he meticulously obtained</p> <p>11 from a heating stage, have significantly improved</p> <p>12 this paper and are deeply appreciated.</p> <p>13 "I would like to also express my</p> <p>14 thanks to Dr. Bryan Bandli at RJ Lee Group for his</p> <p>15 detailed and constructive review of this</p> <p>16 manuscript."</p> <p>17 You see that?</p> <p>18 A. Yes.</p> <p>19 Q. I may be mistaken, but I thought last</p> <p>20 week when I deposed you, you had said that you</p> <p>21 didn't know Bryan Bandli except for a meeting in</p> <p>22 Chicago that had occurred some years previously.</p> <p>23 MR. HYNES: Misstates prior</p> <p>24 testimony.</p> <p>25 A. No, I think the first time I met him</p>
<p style="text-align: right;">Page 220</p> <p>1 compare the CSDS against a Becke line image,</p> <p>2 correct?</p> <p>3 A. Correct.</p> <p>4 Q. This is the first time, that you're</p> <p>5 aware of, that this methodology has ever been</p> <p>6 published, correct?</p> <p>7 MR. HYNES: Vague; overbroad.</p> <p>8 A. No. I only says that's the first</p> <p>9 time Dr. Gunter take the picture.</p> <p>10 Q. Are you aware of any other published</p> <p>11 literature saying that you should utilize the Becke</p> <p>12 line method in conjunction with the dispersion</p> <p>13 staining method to determine the refractive index of</p> <p>14 a mineral?</p> <p>15 A. I don't have to.</p> <p>16 Q. So the answer is no?</p> <p>17 A. No.</p> <p>18 Q. Okay. Thank you.</p> <p>19 A. No.</p> <p>20 Q. If we continue to page 110, we see</p> <p>21 Figures 9 and Figures 11. Figure 11 is the</p> <p>22 three-mode dispersion staining, which I believe is</p> <p>23 the same thing that you brought with you on the</p> <p>24 first day of this deposition.</p> <p>25 A. That's correct.</p>	<p style="text-align: right;">Page 222</p> <p>1 is in Chicago; I did not say I have never interact</p> <p>2 with him after that.</p> <p>3 Q. Okay. This paper in 2023, you</p> <p>4 collaborated with Dr. Gunter who you've known for 40</p> <p>5 years, and Bryan Bandli, correct?</p> <p>6 A. No. I sent him for review.</p> <p>7 Q. That's collaboration.</p> <p>8 A. That's right.</p> <p>9 Q. So the answer to my question is yes?</p> <p>10 A. I didn't -- I don't know what you</p> <p>11 mean "collaboration" but --</p> <p>12 Q. I'll rephrase it.</p> <p>13 For this paper in 2023, you worked</p> <p>14 with Bryan Bandli and Mickey Gunter to publish this</p> <p>15 paper, correct?</p> <p>16 A. I wrote the paper, then I sent him</p> <p>17 for review to get their feedback. That's it.</p> <p>18 Q. Okay. Have you maintained a working</p> <p>19 relationship with Matt Sanchez after your initial</p> <p>20 meeting with him that you discussed last week?</p> <p>21 A. I don't know how do you define a</p> <p>22 working relationship, but I did work with him.</p> <p>23 Okay.</p> <p>24 Q. What else have you worked with Matt</p> <p>25 Sanchez on?</p>

<p style="text-align: right;">Page 223</p> <p>1 A. I think in June.</p> <p>2 Q. The Pittsburgh project?</p> <p>3 A. Correct.</p> <p>4 Q. I'm not talking about the Pittsburgh</p> <p>5 project. Other than the Pittsburgh project, what</p> <p>6 else have you ever worked with Matt Sanchez on?</p> <p>7 A. Never, I don't think so.</p> <p>8 Q. Other than the Pittsburgh project and</p> <p>9 this paper in 2023, what else have you ever worked</p> <p>10 with Bryan Bandli on?</p> <p>11 A. I think I sent him a paper about the</p> <p>12 dispersion staining color manuscript for him to</p> <p>13 review.</p> <p>14 Q. Okay.</p> <p>15 A. That's the only -- the other</p> <p>16 so-called working relationship.</p> <p>17 Q. Have you had interaction with any of</p> <p>18 the other scientists or microscopists at the RJ Lee</p> <p>19 Group other than Mr. Sanchez -- Dr. Sanchez and</p> <p>20 Dr. Bandli?</p> <p>21 A. Well, when we were working in the</p> <p>22 RJ Lee lab last June, like Monica, she was</p> <p>23 providing, like, logistic support for us.</p> <p>24 Q. Okay. Other than for the Pittsburgh</p> <p>25 project, other than that, have you ever had any</p>	<p style="text-align: right;">Page 225</p> <p>1 Q. You know this?</p> <p>2 A. Yeah.</p> <p>3 Q. Okay. It's just an excerpt, but if</p> <p>4 you'd turn to the next page -- turn to the next</p> <p>5 page.</p> <p>6 A. Okay.</p> <p>7 Q. This is page 83 of this document.</p> <p>8 You see in the second full</p> <p>9 paragraph -- by the way, did I mark this Exhibit 39?</p> <p>10 This will be Exhibit 39.</p> <p>11 The second full paragraph states,</p> <p>12 "The matching wavelength is represented by color</p> <p>13 borders on the particle of interest."</p> <p>14 Do you see that?</p> <p>15 A. Yes.</p> <p>16 Q. Okay. What Dr. McCrone says here is</p> <p>17 that the matching wavelength -- which is a term that</p> <p>18 Dr. McCrone invented, correct?</p> <p>19 A. No.</p> <p>20 Q. No? Okay. I thought --</p> <p>21 A. I said already, invented by a Russian</p> <p>22 microscopist called Cherkasov in 1930s.</p> <p>23 Q. Okay.</p> <p>24 A. Dr. McCrone referred to his paper.</p> <p>25 Q. All right. I thought maybe you had</p>
<p style="text-align: right;">Page 224</p> <p>1 other interactions with other scientists who you</p> <p>2 knew to be affiliated with the RJ Lee Group?</p> <p>3 A. No.</p> <p>4 Q. Tell me about -- what is your view on</p> <p>5 Walter McCrone with regards to the proficiency of</p> <p>6 establishing standards applicable to polarized light</p> <p>7 microscopy?</p> <p>8 A. He is a well-respected scientist.</p> <p>9 Q. Did you know Dr. McCrone?</p> <p>10 A. Yes, I know him.</p> <p>11 Q. Do you rely on his work?</p> <p>12 MR. HYNES: Overbroad.</p> <p>13 A. What do you mean by "rely on his</p> <p>14 work"? I have never -- you see, the only thing I</p> <p>15 refer to his work is the 1967, the dispersion</p> <p>16 staining color chart. And that's the 1967 paper.</p> <p>17 And I don't remember which paper, I cite another</p> <p>18 reference from Dr. McCrone.</p> <p>19 Q. You understand Dr. McCrone to be a</p> <p>20 well-respected imminent scientist in his field, at</p> <p>21 least until he passed away, correct?</p> <p>22 A. Yes.</p> <p>23 Q. I'm going to hand you a publication</p> <p>24 by Walter McCrone called "Asbestos Identification."</p> <p>25 A. Yes, I know this.</p>	<p style="text-align: right;">Page 226</p> <p>1 published something differently, so I'll re-ask the</p> <p>2 question.</p> <p>3 "The matching wavelength" -- which is</p> <p>4 what it is that you're trying to identify in</p> <p>5 polarized light microscopy, correct?</p> <p>6 A. Correct.</p> <p>7 Q. -- "is represented by colored borders</p> <p>8 on the particle of interest."</p> <p>9 That's what he wrote, correct?</p> <p>10 A. Correct.</p> <p>11 Q. Okay. Dr. McCrone did not write that</p> <p>12 you should utilize dispersion staining with a Becke</p> <p>13 line analysis ever that you're aware of, correct?</p> <p>14 A. Correct.</p> <p>15 Q. All right. I'm changing topics now.</p> <p>16 A. Okay.</p> <p>17 Q. I'm going to ask you about</p> <p>18 Michel-Levy charts for just a moment, and then I</p> <p>19 think we can probably take a break. Okay?</p> <p>20 A. Okay.</p> <p>21 Q. All right. So, Michel-Levy charts</p> <p>22 are a method for determining the birefringence of a</p> <p>23 particle, correct?</p> <p>24 A. Correct.</p> <p>25 Q. It's not the only method, but it is a</p>

<p style="text-align: right;">Page 227</p> <p>1 method, correct?</p> <p>2 A. Yes, one of the method.</p> <p>3 Q. I'm going to have to put this one on</p> <p>4 the screen, I think, but this will be Exhibit 40.</p> <p>5 And it is just a -- I broke the computer. Make this</p> <p>6 bigger.</p> <p>7 Exhibit 40 is an example of a</p> <p>8 Michel-Levy color chart, correct?</p> <p>9 A. Correct.</p> <p>10 Q. So birefringence is determined by the</p> <p>11 relative refractive indices in the gamma and alpha</p> <p>12 directions, correct?</p> <p>13 A. Correct.</p> <p>14 Q. Okay.</p> <p>15 A. But, it was not used by Michel-Levy</p> <p>16 chart. Michel-Levy chart never used that.</p> <p>17 Q. No, I understand. The Michel-Levy</p> <p>18 charts don't calculate birefringence that way</p> <p>19 because it's a reference chart. You reference a</p> <p>20 viewed color and you compare it to the chart given</p> <p>21 other parameters, correct?</p> <p>22 A. There's two way to determine</p> <p>23 birefringence: One is Michel-Levy chart, another is</p> <p>24 by determine the absolute refract index of gamma and</p> <p>25 alpha. This is two separate methods.</p>	<p style="text-align: right;">Page 229</p> <p>1 A. No, not at all. You know the history</p> <p>2 of this chart was developed by petrologist. At that</p> <p>3 time, at early age, people don't measure</p> <p>4 birefringence by locating particle because when you</p> <p>5 examine the petrographic thick section, the standout</p> <p>6 thickness is 30 micron. So it's a uniform thickness</p> <p>7 on glass slide.</p> <p>8 Where you try to identify a rock,</p> <p>9 what type of rock, was it volcanic or sedimentary,</p> <p>10 you always cut a rock into 30-micron thick slices;</p> <p>11 therefore, you see this 30 is in the middle, not the</p> <p>12 standard thickness, to determine birefringence using</p> <p>13 the Michel-Levy chart.</p> <p>14 The chart has other thickness. It</p> <p>15 doesn't mean it would change the refract index, the</p> <p>16 thickness related to the birefringence. The thicker</p> <p>17 the thickness, the higher the birefringence.</p> <p>18 Q. Okay.</p> <p>19 A. Another important issue is --</p> <p>20 Q. Go ahead. I'll leave that up.</p> <p>21 A. Here it says, like in the down</p> <p>22 indicate .005. That's the birefringence. It could</p> <p>23 be the mineral 1.65 gamma, alpha 1.60.</p> <p>24 Q. Um-hum.</p> <p>25 A. It could be another mineral. It's</p>
<p style="text-align: right;">Page 228</p> <p>1 Q. I very much understand that. Okay.</p> <p>2 A. Yeah.</p> <p>3 Q. What I'm saying is, scientifically,</p> <p>4 birefringence is determined by the refractive index</p> <p>5 of the particle that you're analyzing, correct?</p> <p>6 A. It was determined, but it's not</p> <p>7 principle of Michel-Levy chart. I have to make very</p> <p>8 clear about that.</p> <p>9 Q. We're missing each other entirely.</p> <p>10 A. Okay.</p> <p>11 Q. All right? Birefringence is a</p> <p>12 reflexion of what the refractive index of the</p> <p>13 measured particle is, just conceptually, right?</p> <p>14 A. Correct.</p> <p>15 Q. In the Michel-Levy charts, on the</p> <p>16 left-hand X axis, I guess it is, it's a vertical</p> <p>17 axis, right, the X axis? I always mess that up.</p> <p>18 But on the left-hand side, the Michel-Levy charts</p> <p>19 lists different values depending on the thickness of</p> <p>20 the particle?</p> <p>21 A. Correct.</p> <p>22 Q. Is this indicative of the proposition</p> <p>23 that various thicknesses of a particle can distort</p> <p>24 light at different rates and, therefore, have</p> <p>25 different refractive indices?</p>	<p style="text-align: right;">Page 230</p> <p>1 alpha is 1.50, but its gamma is 1.55. So, this</p> <p>2 chart is unrelated to the gamma and the alpha.</p> <p>3 Q. Okay. Because that's a separate</p> <p>4 method of calculating --</p> <p>5 A. That's right.</p> <p>6 Q. -- birefringence?</p> <p>7 Doctor, you have to let me finish my</p> <p>8 question.</p> <p>9 A. Okay. Sorry.</p> <p>10 Q. You can continue.</p> <p>11 A. So this chart was developed</p> <p>12 specifically for the petrologist looking for the</p> <p>13 thin section. It's not for the particle</p> <p>14 identification because you don't know the accurate</p> <p>15 particle thickness.</p> <p>16 Q. Okay. So, let's talk about</p> <p>17 thicknesses and refractive indexes for a minute.</p> <p>18 A. Um-hum.</p> <p>19 Q. You've seen that I use reading</p> <p>20 glasses. Reading glasses distort the light going to</p> <p>21 your eyes, correct?</p> <p>22 A. That's right.</p> <p>23 Q. They have a refractive index?</p> <p>24 A. Correct.</p> <p>25 Q. The glass in your reading glasses has</p>

<p style="text-align: right;">Page 231</p> <p>1 a refractive index?</p> <p>2 A. Correct.</p> <p>3 Q. If I make that glass thicker, it will</p> <p>4 distort the light more, correct?</p> <p>5 A. Depending the refract index of the</p> <p>6 glass.</p> <p>7 Q. Right.</p> <p>8 A. If the refract index is the same, no,</p> <p>9 the reflection angle is the same.</p> <p>10 Q. Right.</p> <p>11 A. It does not change the refract index</p> <p>12 of the glass.</p> <p>13 Q. When you change a prescription in</p> <p>14 your glasses, you are changing the refractive index</p> <p>15 of what is being fed to your light -- to your eyes</p> <p>16 through the glasses, correct?</p> <p>17 A. No, no, no. The "prescript" lens is</p> <p>18 the curvature at the angle of incident and</p> <p>19 refracted. So the thickness, if the same material,</p> <p>20 same glass, whether it's glass, or later which</p> <p>21 people use polycarbonate, the plastic, okay, and the</p> <p>22 plastic has a high refractive index; therefore, make</p> <p>23 the lens thinner, which is good for the wearer.</p> <p>24 Q. Okay. If you have a mineral that is</p> <p>25 bundled, where there's multiples, individuals of</p>	<p style="text-align: right;">Page 233</p> <p>1 out of the microscope.</p> <p>2 So, it's like, for example, the blue</p> <p>3 light has 86.5 degree of critical angle for the 1.55</p> <p>4 oil and the typical 1866 chrysotile, okay? For the</p> <p>5 red light is 83.5 degree. Whenever it interface,</p> <p>6 the angle with the incident light is at the critical</p> <p>7 angle; for example, for the blue wavelength, which</p> <p>8 are 86.5 degree, if I remember correctly, then that</p> <p>9 blue wavelength will be totally refracted. Okay?</p> <p>10 Q. A fiber of a given refractive index</p> <p>11 will distort light differently than a bundle of</p> <p>12 those same fibers even if those same fibers all have</p> <p>13 the same refractive index, direct?</p> <p>14 MR. HYNES: Incomplete hypothetical.</p> <p>15 A. Yes and no. It doesn't matter it's a</p> <p>16 fiber bundle or single fiber. Even if single fiber.</p> <p>17 The best example is the glass. See,</p> <p>18 in order to meet NVLAP requirement for asbestos lab,</p> <p>19 I develop a method to calibrate the oil, use the</p> <p>20 Cargille glass standards. The glass are single</p> <p>21 particles, however, the edge, sometime they're very</p> <p>22 steep, very sharp; therefore, a single particle will</p> <p>23 show distorted dispersion staining color. That's</p> <p>24 why my method has been widely used by asbestos labs.</p> <p>25 So when I go to the lab, they ask me:</p>
<p style="text-align: right;">Page 232</p> <p>1 that mineral, stacked on top of each other.</p> <p>2 A. Yes.</p> <p>3 Q. And each of them have the same</p> <p>4 refractive index. Okay?</p> <p>5 You with me so far?</p> <p>6 A. Yes.</p> <p>7 Q. Would the bundle not distort the</p> <p>8 light more than a thinner section of that same</p> <p>9 bundle?</p> <p>10 A. Yes.</p> <p>11 Q. Okay. Isn't the refractive index a</p> <p>12 measurement of the degree to which light is</p> <p>13 distorted through the particle? Isn't that what it</p> <p>14 is?</p> <p>15 A. No.</p> <p>16 Q. No?</p> <p>17 A. "Distorted" is not a "terminolog" in</p> <p>18 this science; reflection is. So, the light is</p> <p>19 refracted by the fiber or the individual component</p> <p>20 of a fiber bundle; therefore, it is a fact by the</p> <p>21 interface between the fibers because the interface</p> <p>22 angle would affect the reflection. If happen, the</p> <p>23 interface incident angle to interface is at the</p> <p>24 critical angle, or exceeding the critical angle,</p> <p>25 that wavelength will be internally totally refracted</p>	<p style="text-align: right;">Page 234</p> <p>1 How come this glass is supposed to be uniform</p> <p>2 refract index, for example, calibrate 1.550 is</p> <p>3 immersion oil, use it at 1.55 glass? They're</p> <p>4 supposed to match very well. However, how come I</p> <p>5 saw a range of dispersion staining color? Like one</p> <p>6 of the picture I took in Pittsburgh.</p> <p>7 Now explain to them: Well, it is the</p> <p>8 total reflection. If a single particle, if the</p> <p>9 interface -- for example, what I'm saying is, like,</p> <p>10 this steep, the incident light coming from the light</p> <p>11 source, if the angle is exceeding 86 or 87 degree,</p> <p>12 then the blue wavelength will be totally reflected.</p> <p>13 In that case, the dispersion staining</p> <p>14 color was distorted because some component of the</p> <p>15 wavelengths is missing due to the total reflection.</p> <p>16 COURT REPORTER: Reflection?</p> <p>17 A. Reflection, therefore, it doesn't</p> <p>18 matter it's a single fiber or fiber bundle. It's</p> <p>19 all determined by the "morpholog," by the interface</p> <p>20 angle.</p> <p>21 MR. BRALY: Should we take a break</p> <p>22 now?</p> <p>23 MR. HYNES: Sure.</p> <p>24 (Recess: 10:11 a.m. to 10:18 a.m.,</p> <p>25 Eastern Standard Time.)</p>

<p style="text-align: right;">Page 235</p> <p>1 BY MR. BRALY:</p> <p>2 Q. Dr. Su?</p> <p>3 A. Okay.</p> <p>4 Q. One of the myriad complaints you have</p> <p>5 with Dr. Longo's PLM testing has to do with the size</p> <p>6 of the particles and their conformity with each</p> <p>7 other.</p> <p>8 You follow what I'm saying?</p> <p>9 A. Yes, I did.</p> <p>10 Q. And I guess the top-line criticism</p> <p>11 here is that if it were truly chrysotile that he's</p> <p>12 finding in these samples, that the chrysotile itself</p> <p>13 would not match the size of the talc particles in</p> <p>14 the samples?</p> <p>15 A. Yes, that was my opinion.</p> <p>16 Q. Okay. And that is based on a milled</p> <p>17 sample of -- this is a milled sample of 1886 -- or</p> <p>18 1866 SRM chrysotile, correct?</p> <p>19 A. Yes and no, because I examine the</p> <p>20 Calidria chrysotile-spiked sample.</p> <p>21 Q. Um-hum.</p> <p>22 A. Okay.</p> <p>23 Q. Okay. So it's --</p> <p>24 A. It's consistent. Okay. Whether it</p> <p>25 is 1866 or Calidria, the particle size is not as</p>	<p style="text-align: right;">Page 237</p> <p>1 I have a copy for you, Kevin.</p> <p>2 If you can hand that down to</p> <p>3 Mr. Hynes.</p> <p>4 Exhibit 41 is an October 5, 2023, TEM</p> <p>5 analysis of length dispersions of sample Calidria.</p> <p>6 A. Yes, I look at the report.</p> <p>7 Q. You're seeing a lot of lengths</p> <p>8 reported here that fall under 10 microns in length,</p> <p>9 correct?</p> <p>10 A. Correct.</p> <p>11 Q. That's inconsistent with what you</p> <p>12 reported in your PowerPoint, correct?</p> <p>13 A. Also inconsistent with the work I did</p> <p>14 in Pittsburgh. I took SEM picture, those structure,</p> <p>15 the SG210 of the SEM, which is equally accurate for</p> <p>16 the length determination. They are much larger than</p> <p>17 the report by MAS.</p> <p>18 Q. Okay. Well, this is page 4 of</p> <p>19 Exhibit 41, if you look at the monitor. You could</p> <p>20 do it on your page, too, if you wish. But it's the</p> <p>21 first TEM photomicrograph here. We see a bundle of</p> <p>22 what's reported as RG210 -- there is no RG210, so</p> <p>23 it's probably a typo, SG210 -- top 001 chrysotile</p> <p>24 reported length of 2.7 microns.</p> <p>25 Do you see that?</p>
<p style="text-align: right;">Page 236</p> <p>1 small as the talc.</p> <p>2 Q. You would agree that there are</p> <p>3 certain advantages that transmission electron</p> <p>4 microscopy can provide over TEM, such as a spectra</p> <p>5 of the chemical composition in the crystal structure</p> <p>6 of the mineral you're looking at; true?</p> <p>7 A. Yes. The TEM method can determine</p> <p>8 the elemental composition of a object by EDX</p> <p>9 technique.</p> <p>10 Q. So you could have assurances that</p> <p>11 what it is that you're looking at is the same as the</p> <p>12 chemical composition of what it is you believe it is</p> <p>13 that you're looking at, right?</p> <p>14 A. Correct.</p> <p>15 Q. Your report seems to suggest that the</p> <p>16 fiber lengths associated with chrysotile will be</p> <p>17 much longer, on the order of, oh, in some cases, 30,</p> <p>18 40, 50 more microns in length, correct?</p> <p>19 A. Correct.</p> <p>20 Q. Are you aware that MAS has conducted</p> <p>21 a TEM analysis of Calidria and found that that's not</p> <p>22 correct?</p> <p>23 A. I'm not aware, because --</p> <p>24 Q. I'm handing you what's marked as</p> <p>25 Exhibit 41.</p>	<p style="text-align: right;">Page 238</p> <p>1 A. Yes, I saw that.</p> <p>2 Q. That's inconsistent with what you</p> <p>3 found in your Pittsburgh project with Mr. Sanchez</p> <p>4 and Mr. Bandli, correct?</p> <p>5 MR. HYNES: Form.</p> <p>6 A. Correct.</p> <p>7 Q. If we scroll ahead, it's page 12 of</p> <p>8 the PDF but it's the next image here, and this is</p> <p>9 reported as Calidria RG144, which is a different</p> <p>10 grade than SG210.</p> <p>11 You see that?</p> <p>12 A. I saw that.</p> <p>13 Q. Which is a -- you would agree this is</p> <p>14 a bundle of chrysotile fibers, right, presuming the</p> <p>15 EDXA all matches in the chrysotile spectrum would</p> <p>16 match, that this is visually a bundle of fibers,</p> <p>17 correct?</p> <p>18 A. I don't know how accurate this image</p> <p>19 is. I would love to look at fiber myself.</p> <p>20 Q. Okay. But this is reporting RG144 as</p> <p>21 a length of 2.1 microns, correct?</p> <p>22 A. Correct.</p> <p>23 Q. Which is inconsistent with what you</p> <p>24 found by polarized light with Matt Sanchez, correct?</p> <p>25 A. By the way, you said is 2.1 micron.</p>

<p style="text-align: right;">Page 239</p> <p>1 Where is the scale bar? Without scale bar, I cannot 2 say it is 2.1 micron. 3 Q. You don't trust the software utilized 4 with TEM to -- 5 A. No. The TEM -- no, I'm not say I'm 6 not trusting it, but I have to look at the scale 7 bar. 8 Q. Sure. Sounds like you're saying 9 you're not trusting it. 10 A. And also, one issue here is if you 11 look at that, the width is .1. 12 Q. Sure. 13 A. The length at 2.1. 14 Q. Um-hum. 15 A. You said the length 21 times than the 16 width. 17 Q. Sure. 18 A. Does that look to you like 21 times? 19 Q. Yes, it does. 20 A. I can measure off the screen -- 21 Q. I think anyone with a set of eyes can 22 see that's about 21 times the length. 23 A. Doesn't look that to me. 24 Q. Okay. 25 A. Okay. I think the ratio, the aspect</p>	<p style="text-align: right;">Page 241</p> <p>1 with him, MAS. Okay. 2 Q. On page 28 of the PDF, we see another 3 image. This is reported as Calidria RG210 again. I 4 believe that's a typo because I don't think there 5 was ever an RG210, but it's reported as the middle. 6 This is 002 chrysotile reported as 7 1.7 microns by .18 microns. 8 Do you see that? 9 A. I saw that. 10 Q. You agree visually that would be a 11 bundle, correct? 12 A. Yes. 13 Q. Okay. So, as far as size 14 distribution goes, you and Dr. Sanchez and 15 Dr. Bandli did not find sizes of Calidria that were 16 in the size range of what I just showed you, 17 correct? 18 A. Incorrect. We found similar size, 19 but we found size much bigger than that. 20 Q. Okay. 21 A. Also, the USP study, that is the best 22 particle size distribution of the spiked chrysotile 23 versus talc. Actually, you cannot use a single, or 24 several images to show the particle size 25 distribution. They plotted the two curves. The</p>
<p style="text-align: right;">Page 240</p> <p>1 ratio, is larger than 21. 2 Q. Okay. 3 A. Um-hum. 4 Q. All right. Take it up with the 5 manufacturers of the software, I suppose, but... 6 A. And didn't even say what 7 magnification on this -- the TEM -- 8 Q. Do you remember the question I asked 9 you? 10 A. Yeah. 11 Q. The question I was asking you was, 12 2.1 microns in length would be inconsistent with 13 what you found with Dr. Sanchez, correct? 14 MR. HYNES: Form. 15 A. What I'm saying is -- 16 Q. Just answer my question, please. 17 A. I'm answering. 18 Q. Thank you. 19 Is the answer, yes, it's inconsistent 20 with what you found with Dr. Sanchez -- 21 MR. HYNES: Form. 22 A. Their data is not consistent with 23 Dr. Sanchez. 24 Q. Very good. 25 A. It's not Dr. Sanchez inconsistent</p>	<p style="text-align: right;">Page 242</p> <p>1 peak of talc is smaller than the peak of chrysotile. 2 Q. Okay. 3 A. That is the true particle size 4 distribution. 5 Q. Listen, if I want you to talk about 6 the USP study, I'll ask you about the USP study. 7 Okay? 8 A. Yeah. 9 Q. So, just so I understand this 10 correctly, you did find Calidria samples in what you 11 evaluated that were under 10 microns in length, 12 correct? 13 A. Yes. 14 Q. The USP particle size study that 15 you're referencing, this was primarily undertaken by 16 Dr. Sanchez, correct? 17 A. I don't know. I really don't know. 18 I don't know who perform, but I know one of the 19 probably investigator is Julie Pier, okay? I have 20 never communicate with Dr. Sanchez about USP study. 21 Q. You don't know if Dr. Sanchez was 22 involved in the USP study? 23 A. No, not at all. I know Julie Pier 24 is. 25 Q. Do you know what Julie Pier's role</p>

<p style="text-align: right;">Page 243</p> <p>1 has been relative to talc manufacturing interests?</p> <p>2 A. No.</p> <p>3 Q. You don't?</p> <p>4 A. Oh, I know she used to work for</p> <p>5 like --</p> <p>6 Q. Imerys?</p> <p>7 A. Yes. Correct.</p> <p>8 Q. Right.</p> <p>9 A. Yeah.</p> <p>10 Q. I want to ask you about a particular</p> <p>11 slide in your PowerPoint. And this is page 45 of</p> <p>12 Exhibit 3, but it's page 25 of your PowerPoint.</p> <p>13 Okay?</p> <p>14 A. Okay.</p> <p>15 Q. You've entitled this slide "MAS's</p> <p>16 Inability to Create Scale Bars."</p> <p>17 You see that?</p> <p>18 A. Yes, I did.</p> <p>19 Q. And you've taken the selected image</p> <p>20 for both of these photographs and extrapolated out</p> <p>21 that that image represents the entire field of view</p> <p>22 available to the microscopist, correct?</p> <p>23 A. Correct.</p> <p>24 Q. Again, you're unaware of whether or</p> <p>25 not the software utilized by MAS allows the analyst</p>	<p style="text-align: right;">Page 245</p> <p>1 A. However --</p> <p>2 Q. No, just answer my question first,</p> <p>3 then do your "however."</p> <p>4 A. Okay.</p> <p>5 Q. Answer my question.</p> <p>6 A. No.</p> <p>7 Q. Okay. Now you could do your</p> <p>8 "however."</p> <p>9 A. Yes. They mark the particle size.</p> <p>10 Q. Right.</p> <p>11 A. Which is indicative, at least the</p> <p>12 current field of view. This two field of view based</p> <p>13 on their own data, not my data. For example, the</p> <p>14 first one, the width of the particle was marked 46.7</p> <p>15 micron, micrometer; therefore, you can calculate the</p> <p>16 field of view whether it's cropped or not. So this</p> <p>17 81814 is based on the MAS data.</p> <p>18 Q. It's based on a visualization based</p> <p>19 on the size of the cropped image that you were given</p> <p>20 to look at.</p> <p>21 A. You don't know it's cropped. Do you</p> <p>22 know?</p> <p>23 Q. You don't know either.</p> <p>24 A. That's right.</p> <p>25 Q. But what I'm saying -- I do know,</p>
<p style="text-align: right;">Page 244</p> <p>1 to take a screen capture of just the area they're</p> <p>2 focused on as opposed to the entire field of view,</p> <p>3 correct?</p> <p>4 A. Yes and no. First, it doesn't matter</p> <p>5 you crop image or not. You see the top particle on</p> <p>6 this two images, they are similar. That is</p> <p>7 impossible, which means the field of view scale is</p> <p>8 incorrect.</p> <p>9 Q. You said that the size of the</p> <p>10 particle is -- you understand that these are</p> <p>11 different particles in each of these photographs,</p> <p>12 right?</p> <p>13 A. They are different samples, but they</p> <p>14 are talc. There's no difference between the</p> <p>15 particle, the identity of particle.</p> <p>16 Q. Fine; but you said that based on the</p> <p>17 size of the image that's presented here -- first of</p> <p>18 all, you don't know what the field of view for</p> <p>19 either of these images was, correct?</p> <p>20 A. I know because I measure the --</p> <p>21 Q. Image?</p> <p>22 A. -- image.</p> <p>23 Q. But the image was cropped. You don't</p> <p>24 know what the total field of view was that the</p> <p>25 microscopist was looking at, do you?</p>	<p style="text-align: right;">Page 246</p> <p>1 actually, but you don't know. But you're basing</p> <p>2 that 814 on a visual extrapolation of what was</p> <p>3 reported as 46.7 taken over the width of the image</p> <p>4 that was provided to you, correct?</p> <p>5 A. Correct.</p> <p>6 Q. You don't know if that was the whole</p> <p>7 field of view?</p> <p>8 A. I don't have to.</p> <p>9 Q. But you don't.</p> <p>10 A. I don't.</p> <p>11 Q. Thank you.</p> <p>12 The same is true for the bottom</p> <p>13 photo. You have a scale bar there, and you utilize</p> <p>14 that scale bar across the width of the image that</p> <p>15 was given to you, but you don't know if that was the</p> <p>16 entire field of view that the analyst was looking</p> <p>17 at, correct?</p> <p>18 A. Correct.</p> <p>19 Q. Thank you.</p> <p>20 A. However --</p> <p>21 Q. Go ahead. You're entitled to do your</p> <p>22 "howevers."</p> <p>23 A. I was not based on my evaluation</p> <p>24 simply by looking at the scale bar or the particle</p> <p>25 size marked by MAS. I also base my observation, my</p>

<p style="text-align: right;">Page 247</p> <p>1 opinion, on the size of the talc particle in both 2 image. If those two field of view is so much 3 different, how could the talc particle there look 4 similar? 5 See, that's another criteria you can 6 tell whether the image was cropped at the same rate. 7 So, this thing where indicate whether it's a full 8 field of view or a cropped field of view. The 9 particles look the same, which means they are either 10 full field of view or cropped at the same rate. 11 That is my conclusion. 12 Again, here is -- the FOV, I'm 13 talking about image field of view. You see? The 14 image have a field of view. It doesn't matter the 15 image had been cropped or not. 16 Q. Those two images that you utilized 17 there, are different images taken from different 18 reports, correct? 19 A. Yeah. Yes. One is 71095, 71940. 20 Q. They were taken from different 21 particles. Regardless of what you think the 22 particle is, they're not the same particle, correct? 23 A. They are. They're both -- the title 24 of the report is the baby powder. 25 Q. The specific particle being viewed is</p>	<p style="text-align: right;">Page 249</p> <p>1 powder was 99.9 percent talcum powder? Who told you 2 that? 3 A. The report told me. 4 Q. You know that baby powder has never 5 been 99.9 percent talc. 6 A. Well, if the chrysotile concentration 7 reported here is point -- less than .01, and they 8 did not identify any other phases component in the 9 baby powder, now, what else could be? 10 Q. Your criticism is based on the idea 11 that Johnson's Baby Powder was 99.9 percent talc? 12 A. No, I was based on the MAS report. 13 Q. Okay. 14 A. Because they did not indicate the 15 other phases in this baby powder; therefore, you 16 minus the chrysotile concentration, you end up 99. 17 Q. Have you ever prepared a heavy liquid 18 separation sample? 19 A. I did. 20 Q. When? 21 A. When I was working for Hercules for 22 certain project. 23 Q. Did you do this one time or was this 24 a routine part of your job? 25 A. Actually, more than one time.</p>
<p style="text-align: right;">Page 248</p> <p>1 not the same particle in both photographs? 2 A. They are different baby powder 3 bottle. 4 Q. I want to ask you about -- I'm going 5 to put this on the screen here. This is Exhibit 3 6 of your -- this is Exhibit 3. This is page 11 of 7 your report. Okay? You have this paragraph at the 8 bottom of page 11. 9 You state, "As shown in the table 10 above, from 2020 to 2024, over a five-year span 11 using various different sample preparation 12 techniques as described in MAS's expert reports, the 13 heavy liquid separation sample preparation procedure 14 produces a series of extremely inconsistent light 15 fractions ranging from 13.4 percent to 24.2 percent 16 in talcum powder products, which further produced 17 chrysotile concentrations ranging from .003 percent 18 to .01 percent. 19 "For baby powder samples consisting 20 of 99.9 percent talcum powder, which should be in 21 the heavy fraction, how is it possible that the 22 light fraction more than 1 percent?" 23 You see that? 24 A. I see that. 25 Q. Who in the world told you that baby</p>	<p style="text-align: right;">Page 250</p> <p>1 Q. Two times, or is this something, like 2 something you did thousands -- 3 A. Oh, much more than that. In my 4 20-years career in Hercules, we did so many project. 5 Some project involved the heavy liquid separation. 6 Q. Have you ever done heavy liquid 7 separation for the purposes of evaluating minerals 8 in talc? 9 A. No. 10 Q. So, your statement here is that "For 11 baby powder samples consisting of 99.9 percent 12 talcum powder, which should be in the heavy 13 fraction, how is it possible for the light fraction 14 more than 1 percent? It is beyond comprehension 15 that these ridiculous two-digit light fraction 16 results did not make MAS realize that something was 17 grossly wrong with each and every sample preparation 18 that it tried over the course of five years." 19 Do you see that? 20 A. I saw that. 21 Q. So, for this to really be ridiculous, 22 you would have to conclude -- or you have to start 23 from the position that the baby powder was, indeed, 24 99.9 percent talc, right? 25 MR. HYNES: Misstates testimony.</p>

<p style="text-align: right;">Page 251</p> <p>1 A. No. I said this report did not 2 report a third phase in the baby powder -- 3 Q. Are you saying p-h-a -- I'm sorry. 4 Are you saying phase, like p-h-a-s-e? 5 A. Yeah. 6 Q. Continue, please. 7 A. Component, a third component in the 8 product, now which only identify the chrysotile and 9 talc. 10 If the report said there is a third 11 or fourth components in the sample, then the 99 12 conclusion was incorrect; however, it says the only 13 other components in this sample is chrysotile, 14 therefore, what else could be? 15 Q. Okay. 16 A. Also, they never said in the light 17 fraction besides chrysotile, there's other things 18 than talc. 19 Q. Okay. Have you ever asked Matt 20 Sanchez about how much talc there is in baby powder? 21 A. No. 22 Q. Ever read any Johnson & Johnson 23 documents to determine how much talc they have in 24 baby powder? 25 A. No.</p>	<p style="text-align: right;">Page 253</p> <p>1 level is equal to -- and I could read this out, but 2 it's not going to make any sense in the record. 3 But, regardless, anyone who's 4 following along with Exhibit 3 at page 72 of the 5 PowerPoint can find the same formula? 6 For "n," what is the sample size that 7 you're using when you conduct this analysis? Is it 8 the slide, is it the -- 9 A. The total amount of the sample to be 10 analyzed. 11 Q. So, total amount of material under 12 the slide? 13 A. Not -- if they put all the amount of 14 the sample on the slides, it is. What I am saying, 15 if the .000017 gram sample they took out from the 16 bottle, if they spread all sample onto slide, yes, 17 they are analyzing that amount. 18 Q. Okay. Is this corrected for, like, 19 the weight of the cover slip and everything else, or 20 is this -- I mean, does that make sense you would do 21 that? 22 Never mind, that's a dumb question. 23 Don't answer my dumb questions. 24 Then -- is this reported in, then, a 25 percentage by weight or does this end up being</p>
<p style="text-align: right;">Page 252</p> <p>1 Q. Are you aware of industry documents 2 that indicate that for something to be a consumer 3 talc product, it only has to have at least 90 4 percent talc in it? Are you aware of this? 5 A. No, I'm not. 6 Q. Okay. So because MAS didn't report 7 the amount of nickel or carbonates or whatever else 8 might be present, you took that to mean that it was 9 chrysotile and talc and nothing else? 10 A. That's right. 11 Q. Okay. Let me ask you about -- let me 12 get this off. Actually, no, I'm going to leave this 13 up there. I'm going to take away the highlight. 14 I like your cars picture, by the way. 15 There is a section of your report, 16 this is page 92 of Exhibit 3 which is page 72 of 17 your PowerPoint. 18 A. I saw that. 19 Q. All right. You want to take a second 20 to go there? 21 A. Yes. I'm on this page. 22 Q. So, I just have some questions about 23 this formula. This formula is "n" meaning the 24 sample size that is large enough to attain the 25 specified maximum allowable error and confidence</p>	<p style="text-align: right;">Page 254</p> <p>1 reported as total grams or... 2 A. Actually, if you look at the report, 3 the report said they sampled that amount of the 4 sample for this analysis. 5 Q. Have you ever seen a calculation like 6 this performed on something relative to PLM 7 microscopy of particles like we're talking about? 8 A. I can only said when I was working at 9 Research Center of Hercules, when we received some 10 project, that's the first thing we do: How much 11 sample we should analyze to reach the 95 perfect 12 confidence level. This is the basic procedure of 13 the determine a component system. Okay. 14 Q. Did you perform this calculation 15 every -- first of all, have you performed this 16 calculation relative to your opinions in this case? 17 A. I performed this calculation using 18 MAS standard. 19 Q. Okay. 20 A. Which showed in slide -- yes, I did, 21 although I did not put on this PowerPoint because 22 the number is too large. 23 What I am saying is, if you plug 24 this .000017 into this equation and you require -- 25 actually, I'm very -- what I'm saying, I allow them</p>

<p style="text-align: right;">Page 255</p> <p>1 probably maximum allowed error, probably 5 percent,</p> <p>2 10 percent. Anybody can do the calculation and turn</p> <p>3 out the confidence level is so small, it just should</p> <p>4 not be used.</p> <p>5 Q. So what I -- I want to start with a</p> <p>6 couple of do you agrees with me, and then we're</p> <p>7 going to go on to the question I'm really asking</p> <p>8 you. Okay?</p> <p>9 A. Okay.</p> <p>10 Q. You agree with me that nowhere in</p> <p>11 your report do you actually show the variable values</p> <p>12 that you use in performing the calculation that</p> <p>13 you're talking about?</p> <p>14 A. I did not document that.</p> <p>15 Q. Thank you.</p> <p>16 You can provide that, correct?</p> <p>17 A. Correct.</p> <p>18 Q. You report that your calculation</p> <p>19 ended up far below 50 percent?</p> <p>20 A. Correct.</p> <p>21 Q. That's at the bottom of page 73 of</p> <p>22 your slide slow.</p> <p>23 Are you able to tell me what values</p> <p>24 you used for variables in this formula, meaning the</p> <p>25 value for "n," the value for "p," and so forth and</p>	<p style="text-align: right;">Page 257</p> <p>1 A. Yes.</p> <p>2 Q. -- that you produced.</p> <p>3 What is this?</p> <p>4 A. This is a talc -- I will have to look</p> <p>5 at the --</p> <p>6 MR. HYNES: Could you just read off</p> <p>7 the file name?</p> <p>8 BY MR. BRALY:</p> <p>9 Q. Yeah; the file name is "Wet-Sieved"</p> <p>10 -- is it "sieved" or "sieved"?</p> <p>11 A. Sieve.</p> <p>12 Q. "Wet-Sieved Talc SG210 1000 SE_ETD."</p> <p>13 A. Yeah, that is SG210 spiked talc</p> <p>14 sample.</p> <p>15 Q. What does "wet-sieved" mean? What</p> <p>16 did you do to the sample?</p> <p>17 A. The wet sieve is using the powder.</p> <p>18 They put in the water and then sieve it, because the</p> <p>19 water make it easier for the particle to pass</p> <p>20 through the holes of the sieve. Okay? That is more</p> <p>21 efficient than dry sieve. Okay? The dry sieve use</p> <p>22 vibration device to shake the sieves so that the</p> <p>23 particle was falling through the holes, but the wet</p> <p>24 sieve is much more efficient to see the kind of fine</p> <p>25 powder samples.</p>
<p style="text-align: right;">Page 256</p> <p>1 so on, and if not, can you provide that data to us?</p> <p>2 A. Of course I can.</p> <p>3 Q. Are you able to recall it now, the</p> <p>4 values that you used for --</p> <p>5 A. No, I cannot recall from my head.</p> <p>6 Q. Okay. Clearly we're going to make a</p> <p>7 request for that data. As long as that can be</p> <p>8 provided to us before you testify again, I think</p> <p>9 we'll be okay. I'm not trying to make a big deal</p> <p>10 out of this.</p> <p>11 In fact, let's go ahead and take</p> <p>12 five. I am maybe close to being done here.</p> <p>13 (Recess: 10:54 a.m. to 11:04 a.m.,</p> <p>14 Eastern Standard Time.)</p> <p>15 BY MR. BRALY:</p> <p>16 Q. Dr. Su, I had a question about the</p> <p>17 materials that you produced after you had authored</p> <p>18 your report from the Pittsburgh project. There is</p> <p>19 a folder in what you produced called "SEM</p> <p>20 Images-Thermo Apereo," A-p-e-r-e-o.</p> <p>21 A. Yes.</p> <p>22 Q. And in that there are a series of</p> <p>23 images, and I'm just going to do a couple of these.</p> <p>24 The first one that I'm going to show you is marked</p> <p>25 as Exhibit 42. This is one of the images --</p>	<p style="text-align: right;">Page 258</p> <p>1 So they wet the sample, put a water</p> <p>2 solution, and sieve it. Then this portion was</p> <p>3 retained by the 400 mesh sieve. They collect that</p> <p>4 from a service, then try to take SEM picture.</p> <p>5 Q. So, this other image, which will be</p> <p>6 Exhibit 43. The file name on this is "Wet-Sieved</p> <p>7 Talc SG 210_6500_SE_ETD."</p> <p>8 A. Let me explain the file name.</p> <p>9 Q. No. Well, sure, go ahead. Tell us</p> <p>10 what the file name.</p> <p>11 A. 6500 magnification. Okay.</p> <p>12 Q. All right.</p> <p>13 A. "SE" is secondary electron image.</p> <p>14 Okay?</p> <p>15 Q. So, we can apply that structure to</p> <p>16 all of the file names in that folder?</p> <p>17 A. That's right.</p> <p>18 Q. Okay. Great. Thank you. That</p> <p>19 actually helps a lot.</p> <p>20 So what we're looking at here is</p> <p>21 SG210 with what, little bits of talc stuck in it?</p> <p>22 A. I think so.</p> <p>23 Q. Is this part of what -- I'm sorry.</p> <p>24 Is this part of what you used to determine the part</p> <p>25 of your report discussing the role of fiber lengths</p>

<p style="text-align: right;">Page 259</p> <p>1 and particle lengths?</p> <p>2 A. Correct.</p> <p>3 Q. Have you prepared any kind of a</p> <p>4 report or summation discussing your opinions</p> <p>5 relative to the data you produced as a result of the</p> <p>6 Pittsburgh meeting in June of this year?</p> <p>7 A. You mean prepare what report?</p> <p>8 Q. That's what I'm asking you: Have you</p> <p>9 prepared a report or a summation of your opinions</p> <p>10 relative to the data you produced in June specific</p> <p>11 to the Pittsburgh project?</p> <p>12 A. Nobody ask me. Okay.</p> <p>13 Q. So you have not?</p> <p>14 A. No.</p> <p>15 MR. BRALY: Chris, are you good to go</p> <p>16 here?</p> <p>17 MR. PLACITELLA: You're ready for me?</p> <p>18 MR. BRALY: I believe so.</p> <p>19 MR. PLACITELLA: Okay. Well, why</p> <p>20 don't we take a five-minute break then, and I'll get</p> <p>21 my stuff together.</p> <p>22 MR. BRALY: Okay. The one document</p> <p>23 that you asked me to print, I'm going to go ahead,</p> <p>24 and that will be the next exhibit in line, which is</p> <p>25 Exhibit 44. Okay.</p>	<p style="text-align: right;">Page 261</p> <p>1 from Dr. Longo, correct?</p> <p>2 A. Correct.</p> <p>3 Q. Okay. And you were able to provide</p> <p>4 your opinions despite any issues you had with the</p> <p>5 lighting, correct?</p> <p>6 A. Yes. I mention the lighting is a</p> <p>7 factor affecting the dispersion staining color.</p> <p>8 Q. Okay. But you were still -- despite</p> <p>9 your issues with the lighting, you were still able</p> <p>10 to provide an opinion based upon the method and data</p> <p>11 that Dr. Longo used, correct?</p> <p>12 A. Correct. All my image or data is</p> <p>13 from MAS reports.</p> <p>14 Q. Okay. And despite the testimony you</p> <p>15 gave about brightness concerning the photo, the data</p> <p>16 that was generated by Dr. Longo's lab enabled you to</p> <p>17 provide an independent opinion in this case,</p> <p>18 correct?</p> <p>19 A. Correct.</p> <p>20 Q. Okay. Now, in this case, the first</p> <p>21 day I counted you mentioned "Becke line" about 79</p> <p>22 times.</p> <p>23 And after you went to Middlesex</p> <p>24 County and witnessed Dr. Longo's testimony, is that</p> <p>25 when you went to Pittsburgh?</p>
<p style="text-align: right;">Page 260</p> <p>1 MR. PLACITELLA: Okay.</p> <p>2 MR. BRALY: All right. I will pass</p> <p>3 the witness at this time and let Mr. Placitella ask</p> <p>4 some questions.</p> <p>5 (Discussion held off the record.)</p> <p>6 CROSS-EXAMINATION BY MR. PLACITELLA:</p> <p>7 Q. I wish I could be there with you this</p> <p>8 morning, Dr. Su. How are you today?</p> <p>9 A. I'm fine. Thank you.</p> <p>10 Q. Thanks for taking the time here.</p> <p>11 In preparing your report related to</p> <p>12 Dr. Longo, were you able to use the photos he</p> <p>13 supplied and make -- and provide opinions concerning</p> <p>14 those photos?</p> <p>15 A. Yes.</p> <p>16 Q. Okay. And were you able to take the</p> <p>17 data that he supplied and provide opinions related</p> <p>18 to that data?</p> <p>19 A. Correct.</p> <p>20 Q. And despite whatever shortcomings you</p> <p>21 indicated earlier on, you were able to take the</p> <p>22 opinions and the data supplied and provide opinions</p> <p>23 in this case, correct?</p> <p>24 A. Correct.</p> <p>25 Q. All right. And your opinions differ</p>	<p style="text-align: right;">Page 262</p> <p>1 A. Yeah, I went Pittsburgh after that.</p> <p>2 Q. Okay. And you did -- and you said</p> <p>3 that one of the definitive tests to perform was the</p> <p>4 Becke line analysis, correct?</p> <p>5 A. Can you say again?</p> <p>6 Q. One of the definitive tests that you</p> <p>7 use was the Becke line test, correct?</p> <p>8 A. Correct.</p> <p>9 Q. How long did it take you to do</p> <p>10 that --</p> <p>11 A. It's very quick. You just --</p> <p>12 Q. -- when you were in Pittsburgh?</p> <p>13 A. Yes. Okay. It's very quick. You</p> <p>14 just switch to a non-central stop dispersion mode.</p> <p>15 Q. Okay. When you were with Dr. Sanchez</p> <p>16 in Pittsburgh, how long were you there?</p> <p>17 A. We were there for two and a half</p> <p>18 days.</p> <p>19 Q. Okay. And the actual -- two and a</p> <p>20 half days, and the actual testing that you did, how</p> <p>21 long did that take?</p> <p>22 A. Oh, I should correct. We were</p> <p>23 there -- we arrived the day before. I mean, we</p> <p>24 worked for two and a half days.</p> <p>25 Q. So you were there three and a half</p>

<p style="text-align: right;">Page 263</p> <p>1 days together?</p> <p>2 A. Yeah. I arrived there the day</p> <p>3 before, I leave the third day. That's why it's half</p> <p>4 day. I leave in the afternoon.</p> <p>5 Q. And in front of the microscope, how</p> <p>6 much time did you spend when you were in Pittsburgh?</p> <p>7 A. I think the first day probably nine</p> <p>8 or ten hour. The second day is pretty similar to</p> <p>9 that. The third day, the half day is, I think, in</p> <p>10 the morning, and one hour in the afternoon. Or one</p> <p>11 hour in the --</p> <p>12 Q. So --</p> <p>13 A. Half afternoon, because I left at 3</p> <p>14 p.m. to the airport.</p> <p>15 Q. Okay. So you spent about 15 to 20</p> <p>16 hours under the microscope?</p> <p>17 A. I think I spent probably 26 or 27</p> <p>18 hours in doing the analysis.</p> <p>19 Q. Okay. So you spent 26 or 27 hours</p> <p>20 doing the analysis. And of the 26 or 27 hours, was</p> <p>21 it -- how much time of that 26 or 27 hours did you</p> <p>22 use to do the Becke line analysis?</p> <p>23 A. I did not count the time. Every time</p> <p>24 I look at dispersion staining color, I turn the</p> <p>25 objective lens to switch that to Becke line mode.</p>	<p style="text-align: right;">Page 265</p> <p>1 Q. Okay. And am I correct that none of</p> <p>2 the work that you did in Pittsburgh involved heavy</p> <p>3 liquid separation?</p> <p>4 A. No.</p> <p>5 Q. So I'm correct; none of it did,</p> <p>6 correct?</p> <p>7 A. Correct.</p> <p>8 Q. Okay. You also at some point</p> <p>9 monitored Dr. Hess's -- Mr. Hess's deposition,</p> <p>10 correct?</p> <p>11 A. Correct.</p> <p>12 Q. All right. Did you help counsel</p> <p>13 prepare for that deposition?</p> <p>14 A. No.</p> <p>15 Q. Did you read the transcript after the</p> <p>16 deposition?</p> <p>17 A. I read part of them so far; not the</p> <p>18 whole transcripts.</p> <p>19 Q. What was your role -- or what did you</p> <p>20 understand your role to be to when monitoring the</p> <p>21 deposition?</p> <p>22 MR. HYNES: Vague.</p> <p>23 A. I want to know how he analyzes</p> <p>24 samples, how he did, because he is the -- he is the</p> <p>25 one who perform the analysis. I want to know the</p>
<p style="text-align: right;">Page 264</p> <p>1 That is the --</p> <p>2 Q. What's your best estimate of the</p> <p>3 amount of time you spent in the Becke line mode of</p> <p>4 the 27 hours?</p> <p>5 A. Probably equal to the amount time</p> <p>6 observing the central stop dispersion staining</p> <p>7 color.</p> <p>8 Q. Okay. And how much did you charge</p> <p>9 for that work, those three days?</p> <p>10 A. Just the hours I've been working.</p> <p>11 Q. Right.</p> <p>12 Do you have any idea what you billed</p> <p>13 them for?</p> <p>14 A. Like, I don't remember exact number,</p> <p>15 but it was calculate by the travel time plus the</p> <p>16 actual time working in the lab.</p> <p>17 Q. And did you record everything you</p> <p>18 did?</p> <p>19 A. Yes.</p> <p>20 Q. And after you did that, you never</p> <p>21 supplemented your MDL report, correct?</p> <p>22 A. No.</p> <p>23 Q. Now, whose idea was it to videotape</p> <p>24 what you were doing?</p> <p>25 A. My idea.</p>	<p style="text-align: right;">Page 266</p> <p>1 detail of his analytical procedure and technique.</p> <p>2 Q. Okay. But you were able to prepare</p> <p>3 your 100-page MDL report without knowing that,</p> <p>4 correct?</p> <p>5 A. Correct.</p> <p>6 Q. Did Mr. Hess testify to anything that</p> <p>7 you disagreed with?</p> <p>8 A. Yes.</p> <p>9 Q. And what was that?</p> <p>10 A. If I can recall from the report I</p> <p>11 read, the first issue is he said for negative</p> <p>12 elongation mineral, the gamma is less than alpha,</p> <p>13 which is totally incorrect.</p> <p>14 Also, the second issue so far after I</p> <p>15 read the transcript is, he said he did not calibrate</p> <p>16 the dispersion staining color by himself; somebody</p> <p>17 else did that. That is also wrong. Because if you</p> <p>18 are the analyst, you will have to calibrate your</p> <p>19 eyes to the dispersion staining color displayed in</p> <p>20 the equipment you used to perform analysis.</p> <p>21 So far, those are two issues I found</p> <p>22 which is wrong.</p> <p>23 Q. Anything else?</p> <p>24 A. Not yet. I have not read the whole</p> <p>25 transcript yet.</p>

<p style="text-align: right;">Page 267</p> <p>1 Q. But you were there. What do you 2 recall that you disagreed with? What else? 3 A. So far I cannot recall from my head. 4 I would trust the transcript; therefore, I have to 5 wrest through the whole transcript to see is any 6 other issue I disagree. 7 Q. So, as you sit here today, the only 8 two things you can recall are what you just 9 testified about, correct? 10 MR. HYNES: Asked and answered. 11 A. Could you say again? Could you 12 repeat the question? 13 Q. Yes. 14 As you sit here today, the only two 15 issues you're able to recall are those that you just 16 spoke to me about, correct? 17 A. Correct. 18 MR. HYNES: Same objection. 19 BY MR. PLACITELLA: 20 Q. Okay. You are -- do you recall that 21 there was some disagreement about -- well, strike 22 that. I won't go there. 23 Are you familiar with a testing 24 method called X-ray diffraction? 25 A. Yes. But I have not reviewed any</p>	<p style="text-align: right;">Page 269</p> <p>1 asbestos in it? 2 MR. HYNES: Vague. 3 A. No, because the powder X-ray 4 diffraction could not determine the aspect ratio. 5 Q. Okay. 6 A. So it cannot determine any 7 asbestiform minerals. 8 Q. So, in your expert opinion, X-ray 9 diffraction cannot be used to detect any asbestiform 10 minerals; true? 11 A. No. 12 Q. And does that include amphiboles as 13 well? 14 A. As well. 15 Q. Okay. And that's based upon your 40 16 years of experience? 17 A. No, it's not based on my experience; 18 it's based on the principle of the technique. 19 Q. Okay. 20 A. The technique can only determine the 21 mineral phase by the crystal structure, but it 22 cannot determine the morpholog. As you know, the 23 morpholog is one of the important criteria to define 24 asbestos mineral. 25 Q. Okay. So, should X-ray diffraction</p>
<p style="text-align: right;">Page 268</p> <p>1 X-ray diffraction report from MAS. 2 Q. That's not my question. My question 3 is: Are you familiar with X-ray diffraction? 4 A. Yes, I do. 5 Q. All right. 6 (Technical difficulty.) 7 BY MR. PLACITELLA: 8 Q. Have you ever used X-ray diffraction 9 for any type of asbestos analysis? 10 A. Not asbestos. 11 Q. Okay. Can you use X-ray diffraction 12 to find chrysotile in talc? 13 A. No, I don't think there are procedure 14 technique to find chrysotile asbestos, I emphasize, 15 not the general chrysotile, but -- 16 Q. Right. 17 A. -- I know we meant chrysotile 18 asbestos. 19 No, there's no technique which can 20 analyze chrysotile asbestos by powder X-ray 21 diffraction. It's not any X-ray diffraction; it's 22 called powder X-ray diffraction. 23 Q. Right. 24 Can you use powder X-ray diffraction 25 as a screening technique to determine if talc has</p>	<p style="text-align: right;">Page 270</p> <p>1 ever be used as a screening technique as a first 2 step in determining whether a product contains 3 asbestos, in your opinion? 4 MR. HYNES: Vague; overbroad. 5 A. I have not research on this project. 6 Q. Well, in your opinion and experience, 7 is X-ray diffraction a valid method as a first step 8 for screening for asbestos in material? 9 MR. HYNES: Vague; overbroad; asked 10 and answered. 11 A. Not asbestos, but as a screening tool 12 for mineral identification. There's a difference 13 between the mineral identification and asbestos 14 identification. 15 Q. Okay. 16 A. When you say "asbestos," it has to be 17 confirm in the morpholog. Since X-ray diffraction 18 could not determine the morpholog, so it's 19 accurately speaking it's not screening tool for 20 asbestos. 21 Q. Okay. Is it a valid screening tool 22 for finding serpentine minerals? 23 A. That's right. It's a screening tool, 24 I repeat, for mineral identification, not involving 25 morpholog.</p>

<p style="text-align: right;">Page 271</p> <p>1 Q. And do you have any idea of what</p> <p>2 the -- how long -- well, strike that.</p> <p>3 I'm going to talk a little bit now</p> <p>4 about -- just a couple of questions about PLM.</p> <p>5 If you're using -- have you ever used</p> <p>6 PLM to determine whether there was asbestiform and</p> <p>7 amphiboles in a product?</p> <p>8 A. No.</p> <p>9 Q. Why not?</p> <p>10 A. Because so far I was asked to review</p> <p>11 the PLM analysis of chrysotile.</p> <p>12 Q. Okay. Do you need to do a Becke line</p> <p>13 analysis to confirm whether something is an</p> <p>14 asbestiform amphibole?</p> <p>15 MR. HYNES: Vague; overbroad.</p> <p>16 A. Could you repeat question, please?</p> <p>17 Q. Sure.</p> <p>18 You talked about the need with</p> <p>19 Mr. Braly to perform a Becke line analysis to</p> <p>20 determine whether what you're saying is chrysotile,</p> <p>21 correct?</p> <p>22 A. Correct.</p> <p>23 Q. All right. Do you have to do the</p> <p>24 same thing when you're trying to determine whether</p> <p>25 an amphibole is asbestiform? Do you still need a</p>	<p style="text-align: right;">Page 273</p> <p>1 A. Okay. Yeah, I'm at page 7.</p> <p>2 Q. Just take a second and look at that.</p> <p>3 For the record, I'm showing him Part</p> <p>4 2 of the CTFA J4-1 Asbestiform Mineral Analysis</p> <p>5 protocol.</p> <p>6 Let me know when you're done looking</p> <p>7 at it, Doctor.</p> <p>8 You with me?</p> <p>9 A. Yes, I finished reading.</p> <p>10 Q. Okay. Sorry.</p> <p>11 Okay. So, under -- see under the</p> <p>12 section where it says "Optical Microscopy and</p> <p>13 Dispersion Staining"?</p> <p>14 A. Yes.</p> <p>15 Q. All right. Would you -- in your</p> <p>16 opinion, is that procedure as outlined in this</p> <p>17 specification sufficient to identify an</p> <p>18 asbestos-containing amphibole without anything else?</p> <p>19 A. I don't think this correct procedure,</p> <p>20 or a complete procedure.</p> <p>21 Q. And why is that?</p> <p>22 A. Because nobody identify asbestos by</p> <p>23 central stop dispersion staining color; you identify</p> <p>24 any asbestos component by refractive index. So here</p> <p>25 it says only about the dispersion staining color in</p>
<p style="text-align: right;">Page 272</p> <p>1 Becke line analysis?</p> <p>2 A. I'm sure I would need that; however,</p> <p>3 so far I have not been asked to do that.</p> <p>4 Q. Well, I understand you haven't been</p> <p>5 asked to do it. I'm asking you, based on your</p> <p>6 expertise as a PLM microscopist, whether in order to</p> <p>7 determine a product, an amphibole product is</p> <p>8 asbestiform, you must do a Becke line analysis?</p> <p>9 A. Yes.</p> <p>10 MR. PLACITELLA: Ben, do you have the</p> <p>11 document that I gave you?</p> <p>12 MR. BRALY: Yes.</p> <p>13 MR. PLACITELLA: Could you mark that</p> <p>14 and give it to the witness?</p> <p>15 MR. BRALY: Yeah, it's Exhibit 44.</p> <p>16 MR. PLACITELLA: Okay. I want to see</p> <p>17 if I can share my screen at the same time.</p> <p>18 Can you see my screen?</p> <p>19 MR. BRALY: Very small.</p> <p>20 MR. PLACITELLA: I'll make it bigger.</p> <p>21 THE WITNESS: Yeah, I can look at the</p> <p>22 hard copy. Which page do you want to --</p> <p>23 MR. HYNES: Seven.</p> <p>24 BY MR. PLACITELLA:</p> <p>25 Q. Can you see my screen now, or page 7?</p>	<p style="text-align: right;">Page 274</p> <p>1 the oil, 1.605. It did not mention how you get the</p> <p>2 dispersion staining color. Because the dispersion</p> <p>3 staining color is affected by the intensity of</p> <p>4 illumination, by the distorted dispersion staining</p> <p>5 color, also by the calibration of the system,</p> <p>6 affected also by the color temperature of the light</p> <p>7 source.</p> <p>8 So, the color is affected by so many</p> <p>9 factors, so nobody ever defined in any literature or</p> <p>10 any test method to define a asbestos component by</p> <p>11 color.</p> <p>12 Q. So --</p> <p>13 A. However, the only parameter which can</p> <p>14 identify is the refract index. The refract index is</p> <p>15 absolute, is intrinsic property of the asbestos</p> <p>16 mineral. Whether you measure it in California,</p> <p>17 measure that in New Jersey, the refract index is the</p> <p>18 same. However, the color would depend which</p> <p>19 polarized light microscope you use, what kind</p> <p>20 intensity of illumination you use, or whether what</p> <p>21 is the color temperature, what the light source,</p> <p>22 whether it's a constant or AED, whether you use a</p> <p>23 daylight filter. They all affect the color</p> <p>24 displayed by the particle.</p> <p>25 So, therefore, you can really not,</p>

<p style="text-align: right;">Page 275</p> <p>1 just by saying you can identify simply by color.</p> <p>2 Q. Okay. So, up at the top it gives you</p> <p>3 the list of the apparatus that's part of this spec,</p> <p>4 right? It says, "Bertrand lens, high-intensity</p> <p>5 light source."</p> <p>6 You see that?</p> <p>7 A. Yes, I saw that.</p> <p>8 Q. So using that apparatus, and this as</p> <p>9 a specification, could you ever determine</p> <p>10 definitively whether a mineral that you're seeing is</p> <p>11 asbestiform or not?</p> <p>12 MR. HYNES: Vague; overbroad.</p> <p>13 A. Anyway, let me emphasize the only way</p> <p>14 you can determine the asbestos, whether it's</p> <p>15 chrysotile or amphibole, is to measure its refract</p> <p>16 index on the polarized light microscopy. This</p> <p>17 procedure does not tell you how to do that. Also,</p> <p>18 it did not mention the color temperature of your</p> <p>19 system. It mention the source, high-intensity light</p> <p>20 source. You can use a different level of intensity.</p> <p>21 Now, you can use the different color</p> <p>22 temperature. You can use the daylight filter or</p> <p>23 not. Each variation will affect the central stop</p> <p>24 dispersion staining color displayed and observed by</p> <p>25 the operator, by the analyst.</p>	<p style="text-align: right;">Page 277</p> <p>1 in this specification. So this specification could</p> <p>2 not produce the correct refract index. I have to</p> <p>3 emphasize, only refract index can identify whether</p> <p>4 it is asbestos or not. But this procedure</p> <p>5 completely missed that procedure, that step.</p> <p>6 Q. Could this specification ever</p> <p>7 identify chrysotile using a PLM, in your opinion?</p> <p>8 A. If you know how to correctly perform</p> <p>9 the dispersion staining technique, if you know how</p> <p>10 to correctly perform the "methododge" and also you</p> <p>11 know how to convert the color into the refract</p> <p>12 index, now you can. If you cannot produce the</p> <p>13 correct assessment of the central stop dispersion</p> <p>14 staining color, then you couldn't.</p> <p>15 Q. Okay. So, how would you</p> <p>16 guarantee -- so if you had to rewrite the</p> <p>17 specification, what would you include?</p> <p>18 A. Well, if I am commissioned to do</p> <p>19 that, I will write a very detail step-by-step</p> <p>20 procedure for analysis. Okay? Then everybody can</p> <p>21 follow.</p> <p>22 Q. Why do you need a detailed</p> <p>23 step-by-step analysis?</p> <p>24 A. Because, as I said, there are so many</p> <p>25 factors affecting the central stop dispersion color</p>
<p style="text-align: right;">Page 276</p> <p>1 Q. So --</p> <p>2 A. Also, a very important procedure here</p> <p>3 is missing. As I said, you can only identify</p> <p>4 whether it is asbestos or not by measuring the</p> <p>5 refract index. This procedure did not tell you</p> <p>6 about that. Even you observe the dispersion</p> <p>7 staining color, how do you get the refract index,</p> <p>8 which is the most important part of the procedure?</p> <p>9 However, this procedure did not tell you.</p> <p>10 Q. All right. So if you gave this</p> <p>11 specification to ten different microscopists, is</p> <p>12 there any way to guarantee consistent results just</p> <p>13 following this specification?</p> <p>14 MR. HYNES: Calls for speculation.</p> <p>15 A. As I said, not by following this</p> <p>16 specification. This specification did not tell you</p> <p>17 the color temperature, did not tell you the light</p> <p>18 source, did not tell you intensity, many factors</p> <p>19 which affect the dispersion staining color. And</p> <p>20 also, it did not tell you, you will have to</p> <p>21 calibrate the dispersion staining color, again, the</p> <p>22 specific instrument, the specific setting, and also</p> <p>23 the specific eyes' perception to the color.</p> <p>24 Q. So --</p> <p>25 A. There are so many factors are missing</p>	<p style="text-align: right;">Page 278</p> <p>1 displayed and observed by the analyst. And also, a</p> <p>2 most important step of procedure is, if you can</p> <p>3 correctly get the dispersion staining color, then</p> <p>4 you will have to convert that color into the</p> <p>5 numerical value of the mineral, then you can</p> <p>6 identify. Without that step, nobody can.</p> <p>7 So, this procedure is so incomplete</p> <p>8 and so vague, but I'm sure I can develop a complete</p> <p>9 procedure to accomplish this task by correctly</p> <p>10 measure the refract index of any mineral, opaque</p> <p>11 mineral by polarized light microscopy.</p> <p>12 Q. So, I do apologize because I</p> <p>13 interrupted you.</p> <p>14 You said you would give a</p> <p>15 step-by-step detailed procedure. Can you just lay</p> <p>16 that out for us? How would you rewrite the</p> <p>17 specification if you really wanted to find out</p> <p>18 whether a product had asbestos in it or not?</p> <p>19 A. Yeah, if I'm commissioned to do that.</p> <p>20 Q. Well, you're getting paid by the hour</p> <p>21 now, so do your best.</p> <p>22 A. Nobody ask me. Okay?</p> <p>23 Q. I'm asking.</p> <p>24 A. Well, okay. I will consider,</p> <p>25 however, and I can bill you for the time?</p>

<p style="text-align: right;">Page 279</p> <p>1 Q. We're being billed in the deposition, 2 Doctor. I just want to know if you have to rewrite 3 the specification to make sure it was capable of 4 finding asbestos in talc, what would you -- what 5 would you put in? Give me your outline, at least. 6 MR. HYNES: Objection to form; asked 7 and answered. 8 A. I would cover every aspect of the 9 correctly measure the central stop dispersion 10 staining color. First, the method or procedure will 11 cover every aspect about the central stop dispersion 12 technique; secondly, my cover -- my procedure will 13 cover how do you derive the object's refract index 14 by central stop dispersion staining technique. 15 So there are two major part: First, 16 there are many details about obtaining the correct 17 central stop dispersion staining color; the second 18 major part will be how do you go from the color to 19 the refract index. 20 Q. Okay. 21 A. If I will write the procedure, I will 22 cover every aspect. 23 Q. So if you were giving advice to 24 Johnson & Johnson for what they should do to screen 25 talc for asbestos, would you ever advise them to use</p>	<p style="text-align: right;">Page 281</p> <p>1 Johnson & Johnson that they use this procedure 2 outlined in this specification to test for asbestos 3 in talc? It's a simple question: Yes or no? 4 MR. HYNES: Same objection. 5 A. It's not yes-and-no question. It is 6 a question: Why should I do that? 7 Q. Because I'm asking you a -- 8 A. Then if I must do that, of course I 9 can. 10 Q. Okay. So, I'm asking you in a 11 deposition so we know what your opinions are on PLM 12 whether you would ever recommend to 13 Johnson & Johnson that they use this specification 14 to screen for asbestos in talc. It's a very simple 15 question. 16 MR. HYNES: Same objection. 17 A. No, it's not a simple question. You 18 mean what I would recommend, why I will have to 19 recommend? That's the first question. If I have 20 to, then you can ask me whether I would do that or 21 not. 22 Q. So, are you refusing to answer the 23 question, Doctor? 24 A. I refuse to answer this question not 25 because I am not capable of outlining a detailed</p>
<p style="text-align: right;">Page 280</p> <p>1 this method that's on this document? 2 A. It have not happened, okay, so I 3 cannot say anything about that. But I can assure 4 you I'm fully capable and qualified to give -- to 5 document a very comprehensive and accurate procedure 6 to perform the analysis. 7 Q. But here's my question, I know you 8 haven't been commissioned to do it. Would you ever 9 recommend to Johnson & Johnson that they use this 10 procedure to screen for asbestos in talc? 11 MR. HYNES: Vague; calls for 12 speculation. 13 A. I have not been asked to; therefore, 14 I don't have to express my opinion. However, if I 15 am asked to, I can do that. 16 Q. Respectfully, Doctor, I'm just asking 17 a simple question: Would you ever recommend to 18 Johnson & Johnson to use this procedure to screen 19 talc for asbestos? That's my question. 20 MR. HYNES: Same objection. 21 A. Why I should recommend to them? 22 Q. I'm asking you as somebody with 23 experience who's testified now for a couple of days 24 and has 40 years of history using a polarized light 25 microscope, would you ever recommend to</p>	<p style="text-align: right;">Page 282</p> <p>1 procedure, it's I need to know what I should 2 recommend or not. I need to know the reason. 3 Q. Let me ask you the question this way. 4 A. Okay. 5 Q. Are you capable of providing an 6 opinion as to whether this specification -- 7 (technical difficulty) 8 A. Of course I'm capable. 9 (Discussion held off the record.) 10 MR. PLACITELLA: We're not sharing a 11 screen anymore, correct? 12 MR. HYNES: Correct. 13 BY MR. PLACITELLA: 14 Q. Are you capable of providing an 15 opinion as to whether Johnson & Johnson should ever 16 use this specification to screen for asbestos in 17 talc? Are you capable of giving that opinion? 18 A. I am capable. 19 Q. Okay. And what is that opinion? 20 A. Is that about whether I'm capable of 21 producing a procedure to determine the refract index 22 of mineral including asbestos? I want a 23 clarification on that. 24 Q. Okay. Let me ask the question a 25 different way.</p>

<p style="text-align: right;">Page 283</p> <p>1 A. Okay.</p> <p>2 Q. If you were a scientist working at</p> <p>3 Johnson & Johnson and assigning somebody the task of</p> <p>4 determining whether there's asbestos in talc, would</p> <p>5 you ever hand them this specification with no other</p> <p>6 instructions and say, "Follow this specification"?</p> <p>7 MR. HYNES: Objection to form; calls</p> <p>8 for speculation.</p> <p>9 A. I still don't understand your</p> <p>10 question because my job here is to assess the</p> <p>11 analytical report by MAS. They found asbestos in</p> <p>12 the chrysotile to be exactly in the baby powder</p> <p>13 product. My job is to assess whether their report</p> <p>14 is correct or not.</p> <p>15 Q. Well, let me ask you the question</p> <p>16 this way: You indicated earlier when I was</p> <p>17 questioning you that Dr. Longo's lab was able to</p> <p>18 generate data and photographs that you could rely</p> <p>19 upon in forming your own opinions, correct?</p> <p>20 A. Correct.</p> <p>21 Q. If Dr. Longo's lab followed this</p> <p>22 specification, would they be capable of generating</p> <p>23 reports and data that you could rely upon?</p> <p>24 MR. HYNES: Incomplete hypothetical;</p> <p>25 calls for speculation.</p>	<p style="text-align: right;">Page 285</p> <p>1 A. Well, the title is "Specification" --</p> <p>2 let me see. Also on the top of the cover,</p> <p>3 CTFA, Cosmetic --</p> <p>4 Q. I'm just talking about the top of the</p> <p>5 page we're looking at.</p> <p>6 A. Yes, "CTFA Specification."</p> <p>7 Q. Right. Okay. And does it say</p> <p>8 "asbestiform amphibole minerals"? Top of page 7.</p> <p>9 A. Talc.</p> <p>10 Page 7, yeah, amphibole.</p> <p>11 Q. Amphibole.</p> <p>12 Would you agree with me as written,</p> <p>13 this was never intended to find chrysotile in talc,</p> <p>14 if it existed?</p> <p>15 A. No. As I said, this specification is</p> <p>16 so complete, and also, it lacks so many details.</p> <p>17 Q. When you say "complete," you mean</p> <p>18 incomplete, correct?</p> <p>19 A. Incomplete, yeah.</p> <p>20 Q. Incomplete.</p> <p>21 A. Not complete.</p> <p>22 Q. Not complete.</p> <p>23 A. Yeah. Incomplete.</p> <p>24 Q. So we're on the same page, and I'll</p> <p>25 stop.</p>
<p style="text-align: right;">Page 284</p> <p>1 A. Which specification? Could you</p> <p>2 please clarify?</p> <p>3 Q. The specification in front of you for</p> <p>4 PLM for Amphiboles - Part 2.</p> <p>5 MR. HYNES: Same objections.</p> <p>6 A. If they perform the technique</p> <p>7 correctly, that is the prerequisite. If they are</p> <p>8 incapable performing the technique correctly, they</p> <p>9 can't; however, if they truly understand the optical</p> <p>10 crystallography, polarized light microscopy and</p> <p>11 optical mineralog, of course they can. However, as</p> <p>12 I repeat, this procedure is so complete, it did not</p> <p>13 tell the analyst how do you determine the refract</p> <p>14 index. So, therefore, this specification is very</p> <p>15 incomplete.</p> <p>16 Q. Would you agree with me that this</p> <p>17 specification indicates it's for amphiboles only?</p> <p>18 A. Not for any mineral.</p> <p>19 Q. It says, for amphiboles; does it not?</p> <p>20 A. No.</p> <p>21 Q. It doesn't? Are we looking at the</p> <p>22 same thing?</p> <p>23 A. It doesn't.</p> <p>24 Q. What's the title say on Phase 2 at</p> <p>25 the top of the page?</p>	<p style="text-align: right;">Page 286</p> <p>1 As written, this specification is so</p> <p>2 incomplete that there's no way it could be used on</p> <p>3 its face to determine whether there's asbestos in</p> <p>4 talc; true?</p> <p>5 A. No.</p> <p>6 Q. Would you agree with the following</p> <p>7 statement: "It's imperative that both dispersion</p> <p>8 staining color and fibrous morphology criteria be</p> <p>9 satisfied, as well as the Becke line determination</p> <p>10 of refractive index, before identifying a particle</p> <p>11 as asbestiform amphibole"?</p> <p>12 A. Not according to this specification.</p> <p>13 Q. And so this specification fails in</p> <p>14 that regard, correct?</p> <p>15 A. That's right.</p> <p>16 Q. Okay. Let me just look here. We</p> <p>17 might have to take five minutes so I can talk to</p> <p>18 Ben. He'll tell me what else I forgot. So why</p> <p>19 don't we just take five minutes. Okay?</p> <p>20 A. Okay.</p> <p>21 (Recess: 11:59 a.m. to 12:06 p.m.,</p> <p>22 Eastern Standard Time.)</p> <p>23 MR. PLACITELLA: So, I don't have any</p> <p>24 other questions at this time, and I'm hopeful you</p> <p>25 can get out of New Brunswick and beat the traffic</p>

<p style="text-align: right;">Page 287</p> <p>1 before it gets bad. So, unless somebody else is 2 going to ask any other questions, I'm done. 3 MR. HYNES: Are there any other 4 questions from people on the line? 5 Hearing none, I will have a couple 6 questions, Dr. Su. Thanks, again, for sitting for 7 this deposition over the last two days. Appreciate 8 it. 9 THE WITNESS: Thanks. 10 CROSS-EXAMINATION BY MR. HYNES: 11 Q. The first thing I wanted to ask you 12 was, today you mentioned this concept of 13 birefringence. You described it as the absolute 14 difference between the alpha and gamma refractive 15 index values. Is that right? 16 A. Correct. 17 Q. So if we looked at some of the 18 sources that you cited in your report, such as R-93, 19 Bloss, ISO 22262-1, we would see that birefringence 20 is defined as this absolute difference between alpha 21 and gamma, correct? 22 A. Correct. 23 Q. Okay. And this idea that you may see 24 a range of refractive index values in chrysotile 25 from the same source, that's something that you</p>	<p style="text-align: right;">Page 289</p> <p>1 ISO 22262-1 in your report? 2 A. Yes. 3 Q. Okay. And does ISO 22262-1 include 4 known ranges for NIST standard chrysotile refractive 5 index values? 6 A. Say again, what question is? 7 Q. Does ISO 22262-1 also include known 8 ranges for refractive index values for NIST standard 9 chrysotile? 10 A. Actually, I don't know because I 11 never read that section, if there is a section of 12 that. 13 Q. Okay. 14 A. Because I know what refract index 15 1866 is. Okay? 16 Q. Okay. So if it's reported in there, 17 it's reported in there. That's fine. 18 Then you were asked a series of 19 questions about this concept of Becke line analysis. 20 There are methods for determining 21 refractive index values of a mineral using Becke 22 line analysis independent of any central stop 23 dispersion staining analysis. Is that right? 24 A. Correct. 25 Q. Okay. The central stop dispersion</p>
<p style="text-align: right;">Page 288</p> <p>1 don't agree with. Is that right? 2 A. No. 3 Q. You will see one true refractive 4 index in alpha and one true refractive index in 5 gamma. Is that right? 6 A. Correct. 7 Q. Okay. 8 MR. PLACITELLA: Let me just put my 9 objection on the record. I'm not going to keep 10 doing it, but these are leading questions of an 11 expert witness in a deposition, and I'm going to 12 object to any of those questions. And if you give 13 me a standing objection to your leading questions, 14 then I won't interrupt anymore. 15 MR. HYNES: Standing objection. 16 BY MR. HYNES: 17 Q. Dr. Su, you also described in, I 18 think, day one of your deposition that you would 19 refer to R-93 for refractive index values in 20 chrysotile. Is that right? 21 A. R-93, EPA method? 22 Q. Yeah. Table 22, I think. 23 A. Yeah, that is the table describing 24 the refract index of the asbestos minerals. 25 Q. Okay. And then do you also cite</p>	<p style="text-align: right;">Page 290</p> <p>1 staining analysis uses Becke line as a complementary 2 way to determine what part of a particle that you're 3 looking at under central stop dispersion staining 4 color, you should use to assign the correct 5 refractive index value. Is that right? 6 A. Correct. 7 Q. Okay. And so, this concept of Becke 8 line analysis, it's not that it's a independent 9 method, it's part of how a trained analyst who knows 10 how to perform central stop dispersion staining will 11 perform their central stop dispersion staining 12 analysis. Is that right? 13 A. No. 14 Q. Tell me more, then. 15 A. Yeah, the Becke line is not a 16 dependent method; it is the independent method. 17 Matter of fact, you can determine the opaque 18 minerals refract index simply by Becke line, but you 19 cannot do this for central stop dispersion staining 20 color technique without Becke line method to 21 differentiate the distorted dispersion staining 22 color from the normal correct dispersion staining 23 color. 24 Q. Okay. So, is it true that a trained 25 analyst who understands the principle of central</p>

<p style="text-align: right;">Page 291</p> <p>1 stop dispersion staining will, in order to determine</p> <p>2 what are true dispersion staining colors versus</p> <p>3 distorted staining colors, they will refer to the</p> <p>4 Becke line to make that call?</p> <p>5 A. Yes. Yes.</p> <p>6 Q. Okay.</p> <p>7 A. A very important part of the</p> <p>8 procedure is to recognize which part of the</p> <p>9 dispersion staining color is the normal dispersion</p> <p>10 staining color and which part of the dispersion</p> <p>11 staining color displayed is distorted dispersion</p> <p>12 staining color. Now, to differentiate between these</p> <p>13 two, you have to use the Becke line. So far that's</p> <p>14 my experience.</p> <p>15 Q. Okay. You were asked some</p> <p>16 hypotheticals about bundle thickness and its impact</p> <p>17 on refractive index values.</p> <p>18 In central stop dispersion staining</p> <p>19 analysis, is it true that bundle thickness will not</p> <p>20 change the refractive index of a mineral being</p> <p>21 analyzed?</p> <p>22 A. No, because the refract index is an</p> <p>23 intrinsic physical property of any crystal, any</p> <p>24 minerals. It was determined by the elemental</p> <p>25 composition, the chemical composition, and the</p>	<p style="text-align: right;">Page 293</p> <p>1 Q. Correct.</p> <p>2 A. Standard TEM grid preparation.</p> <p>3 Q. But do you know what was done,</p> <p>4 whether or not there was liquid density separation</p> <p>5 technique used, sonication performed, wet-sieving,</p> <p>6 anything of that nature before these materials were</p> <p>7 analyzed by TEM? Is that information included in</p> <p>8 what you were shown today?</p> <p>9 A. No.</p> <p>10 Q. And sample preparation procedures may</p> <p>11 impact the size distribution of particles that are</p> <p>12 being analyzed subsequently by TEM, right?</p> <p>13 A. Correct.</p> <p>14 MR. BRALY: Object to this. He's</p> <p>15 been offered as an expert in PLM. But go ahead.</p> <p>16 That's fine.</p> <p>17 BY MR. HYNES:</p> <p>18 Q. You answered that's right, right?</p> <p>19 A. Yes.</p> <p>20 Q. And you were asked some questions</p> <p>21 about a NVLAP inspection in 2016.</p> <p>22 Do you recall that questioning?</p> <p>23 A. Yes, I did.</p> <p>24 Q. That's when you were an assessor and</p> <p>25 you went to MAS's laboratory to review the</p>
<p style="text-align: right;">Page 292</p> <p>1 crystal structure, the way how those atoms connect</p> <p>2 to each other.</p> <p>3 Now, these two property will not</p> <p>4 change with size or thickness of a material, a</p> <p>5 mineral. So, even the size of the change, the</p> <p>6 refract index is not. Again, I have to, if refer to</p> <p>7 asbestos to chrysotile. And we have evidence, as I</p> <p>8 said, the standard reference material 1866 series,</p> <p>9 whether 1866, 1866a or 1866b, they are measured as</p> <p>10 single fibrils. You cannot go any thinner than</p> <p>11 that. Therefore, the refract index value, the gamma</p> <p>12 1.556, alpha 1.549 is for the chrysotile. It did</p> <p>13 not change with the fiber size or bundle size.</p> <p>14 Q. Shifting gears: Counsel for</p> <p>15 plaintiff marked Exhibit 41, a series of count</p> <p>16 sheets for TEM analysis of chrysotile SG210.</p> <p>17 Do you recall reviewing that for the</p> <p>18 first time during today's deposition?</p> <p>19 A. Yes.</p> <p>20 Q. Okay. The count sheets and</p> <p>21 photomicrographs that you were provided, do they</p> <p>22 provide any information for you about the sample</p> <p>23 preparation process for the materials being analyzed</p> <p>24 here?</p> <p>25 A. Sample preparation?</p>	<p style="text-align: right;">Page 294</p> <p>1 conditions at the time in, I believe it was</p> <p>2 September of 2016, correct?</p> <p>3 A. Correct.</p> <p>4 Q. That predates any of the</p> <p>5 Johnson & Johnson reports that you've reviewed in</p> <p>6 this case, correct?</p> <p>7 A. No. No. I was not aware of --</p> <p>8 again, they have not give me any of those material</p> <p>9 for me to review. And the assessment, as matter of</p> <p>10 fact, only concern two technique: One is the bulk</p> <p>11 asbestos analysis by EPA; the second is the airborne</p> <p>12 asbestos analysis by EPA. So that's only two</p> <p>13 technique I need to assess, not actual sample they</p> <p>14 apply that. But normally, we want focus on AHERA.</p> <p>15 I will ask them AHERA analysis, but not any other</p> <p>16 client request.</p> <p>17 Q. So the types of analyses that you</p> <p>18 reviewed that Dr. Longo produced in which he</p> <p>19 identified chrysotile by PLM in Johnson & Johnson</p> <p>20 Baby Powder containers, those sorts of procedures</p> <p>21 were not something you evaluated during that visit</p> <p>22 in 2016?</p> <p>23 A. No, not at all.</p> <p>24 Q. And then correct me if I'm wrong, but</p> <p>25 would a laboratory that receives a NVLAP audit</p>

<p style="text-align: right;">Page 295</p> <p>1 receive the audit reports that are prepared by the 2 assessor, and then the reviewer who assesses the 3 report of the assessor that actually made the site 4 visit, would they get those materials? 5 A. Oh, yes, they do. Actually, before 6 the assessor leave the lab after the completing the 7 assessment, you will have to review the whole report 8 and get their signature. You have to give them a 9 complete copy, which have the three form, the 10 general criteria form, the polarized -- the bulk 11 asbestos form, the PLM form, and the third is the 12 TEM form. 13 Q. And have you been a reviewer of an 14 assessor's report at MAS since this 2016 timeframe? 15 A. Yes, I did. 16 Q. Did you have criticisms of MAS after 17 this 2016 NVLAP report was issued? 18 A. Yes. And I recognized there's a page 19 of the -- my assessment in 2016, and there is a page 20 of Dr. Bo Li's assessment in 2021, let me see, 2021 21 or 2022. Yeah, I saw a sheet that remember me, yes, 22 I reviewed Dr. Bo Li's assessment report. That is 23 part of the NVLAP procedure. I did not ask to 24 review -- assign the review work to me. 25 Q. And you got criticisms of MAS's PLM</p>	<p style="text-align: right;">Page 297</p> <p>1 will affect, because all your past reports, they 2 were wrong. I remember I made that comment in my 3 review. 4 Q. And that was -- those comments and 5 that review, that all happened before you had ever 6 seen any of Dr. Longo's analyses of chrysotile in 7 cosmetic talcs? 8 A. No, it was in 2021, I wasn't aware. 9 I know nothing about the talc sample. 10 Q. Okay. And do you know whether or not 11 Dr. Longo's laboratory is currently a NVLAP 12 accredited laboratory for PLM work? 13 A. Not right now, but they used to. 14 They used to, I think. 15 Q. All right. You were asked a number 16 of questions about the CTFA J4-1 methodology. 17 Do you recall those questions by 18 Mr. Placitella? 19 A. Yes. 20 Q. Were you familiar with the 21 specification before you saw it during the course of 22 today's questioning, or is this the first time that 23 you've seen it? 24 A. That's the first time I saw that. 25 Q. Okay. So you don't know when this</p>
<p style="text-align: right;">Page 296</p> <p>1 procedures in that 2021 -- 2 A. Correct. Because one of the 3 nonconformity reported documented in Dr. Bo Li's 4 report is they confuse the alpha and gamma for 5 chrysotile in their count sheets. And when MAS 6 respond to this report, to this nonconformity, they 7 said it did not affect the past analysis because 8 NVLAP procedure required where you identify a 9 nonconformity, one of the thing the lab will have to 10 review what kind impact are your past work, if you 11 made some mistake; now, what kind of impact on the 12 past work until this time the mistake was identified 13 by the assessor. 14 So, I remember the response from MAS 15 was it did not affect the past analysis, which I 16 don't -- I did not agree, because that is so basic, 17 such a major mistake. Alpha is smaller than gamma. 18 How could you, in your bench sheet, you said the 19 alpha is greater than gamma. Of course this mistake 20 affect every report you issued before Dr. Bo Li's 21 assessment. Okay? 22 So, the lab respond and says we were 23 correct that; however, we don't think it would 24 affect the past results. Therefore, in my comments, 25 I said there's such a fundamental mistake, sure it</p>	<p style="text-align: right;">Page 298</p> <p>1 was promulgated? 2 A. What? 3 Q. Do you know what year this was 4 promulgated? 5 A. No. Must be a number of years ago. 6 I think I had some vague impression reading some 7 paper, they said there was a method, but I never 8 seen that method document myself. 9 Q. Okay. And you don't know any of the 10 context in which this method was developed. Is that 11 right? 12 A. No, not at all. 13 Q. Okay. And one of the things that you 14 mentioned here was that the method itself doesn't 15 provide, you know, the level of specificity that you 16 would require for soup to nuts polarized light 17 microscopy analysis of asbestiform minerals in talc. 18 Is that right? 19 A. That's right. 20 Q. Okay. You would go to other 21 potential references for further information about 22 how to perform the specific central stop dispersion 23 staining analysis beyond what's presented on this 24 page 7 of what you were shown. Is that right? 25 A. That's right.</p>

<p style="text-align: right;">Page 299</p> <p>1 MR. PLACITELLA: Objection; leading. 2 Objection; leading. 3 MR. HYNES: Go ahead. 4 A. However, the major -- major flaw of 5 this specification is, they did not have the key 6 procedure to determine the numerical refract index 7 of the amphibole. Without that data, there's no way 8 you can identify whether the target object is 9 amphibole or not. 10 Q. Say, in 1976 or 1977, what references 11 would you go to for that information that you just 12 described? 13 A. I don't know. Maybe McCrone. Okay? 14 Q. Okay. 15 A. Dr. McCrone had developed the graphic 16 solution from dispersion staining color to the 17 numerical refractive index. I believe at that time 18 Dr. McCrone had that procedure. You can use his 19 graphic solution to get the numerical value of the 20 asbestos mineral or any mineral from its central 21 stop dispersion staining color. 22 Q. And one of the things that's noted on 23 the following page is that dispersion staining 24 device that's commercially available would be from 25 Walter McCrone. Is that right?</p>	<p style="text-align: right;">Page 301</p> <p>1 you didn't. 2 MR. HYNES: Well -- 3 MR. PLACITELLA: And I will bring it 4 to the attention of the Court. 5 MR. HYNES: Why don't we walk through 6 what he brought with him and then you can decide 7 whether or not you want to continue to object. 8 BY MR. HYNES: 9 Q. Go ahead, Dr. Su. What did you 10 bring? 11 A. Okay. The first one is my -- my 12 paper in 2022, "The Dispersion Staining Technique 13 and Its Application to Measuring Refractive Indices 14 of Non-Opaque Materials With Emphasis on Asbestos 15 Analysis," which was published in the journal, "The 16 Microscope." That's the first thing I brought. 17 Q. That was Exhibit 13 to day one? 18 A. Yeah. That was on the first day 19 deposition. 20 The second thing I brought was the 21 transcript -- 22 Q. Exhibit 32. 23 A. Exhibit 32 of the last deposition. 24 The third document I brought, yeah, 25 was two table, which one is the chrysotile in</p>
<p style="text-align: right;">Page 300</p> <p>1 A. That means the dispersion staining 2 objective. 3 Q. Right. 4 Okay. And then you brought a couple 5 of documents with you to today's deposition. I 6 don't know what they are, so, do you want to just 7 tell us what they are and maybe we'll mark them as 8 exhibits. 9 A. Okay. 10 MR. PLACITELLA: Are these documents 11 that have been disclosed before? 12 MR. HYNES: He brought them with him 13 to today's deposition, so I do not know. 14 MR. PLACITELLA: Well, that's not 15 fair and I object to any questions about them. 16 That's not fair. You knew they were coming. If you 17 had that document he was bringing, he should have 18 disclosed them. I mean, this deposition by ambush 19 that you've been conducting now for two days needs 20 to stop. 21 MR. HYNES: I apologize, 22 Mr. Placitella, however -- 23 MR. PLACITELLA: There's no apology. 24 This was deliberate. This was deliberate. He had 25 the documents. You could have turned them over and</p>	<p style="text-align: right;">Page 302</p> <p>1 Cargille oil 1.550; the second is the chrysotile in 2 Cargille 1.560, which were used to -- by MAS. 3 MR. BRALY: Do you mind if I just 4 take a look at them? 5 A. (Handing.) 6 Q. So those are your -- 7 A. Yeah -- 8 Q. -- tables? 9 A. That's my table plus the ISO 10 dispersion staining color chart provide by -- from 11 ISO document. 12 MR. HYNES: Okay. So, and 13 that's -- just for the record, so I guess what we 14 have is, it looks like -- so the first page in this 15 manila folder is chrysotile in Cargille 1.550E, and 16 so it looks like Dr. Su took the alpha and gamma 21 17 degrees Celsius from his 2022 publication along with 18 the wavelength column of that table, and then in the 19 middle of those he put the ISO color bar. 20 BY MR. HYNES: 21 Q. So, everything is together on one 22 page. For ease, you're matching up. Is that right? 23 A. Yes. 24 Q. Okay. And then the next page of this 25 is the same thing, with the 1.560 from that. I</p>


<p style="text-align: right;">Page 303</p> <p>1 guess it's the excerpts of the table from the same 2 publication. Is that right? 3 A. Correct. 4 Q. Okay. And then the next is just the 5 full table for 1.550; and then the next is the full 6 table for 1.560, right? 7 A. Yeah. 8 Q. Okay. And then did you bring 9 anything else with you? 10 A. Yeah. The third document I brought 11 is my MDL report on May 21st of 2024. 12 Q. Okay. 13 A. I think that's all. 14 Q. Right. 15 I guess -- so, why did you bring 16 these charts, Dr. Su? 17 A. Yeah, because I was evaluate the 18 Exhibit 32, because I was asked in last session 19 about the bentonite report by MAS. At that time I 20 answered they are Calidria chrysotile. Now I 21 realize after I exam the Exhibit 32 provide by the 22 plaintiff, I realize my answer was wrong. They were 23 not Calidria chrysotile. 24 Q. Okay. 25 A. And based on the refract index value,</p>	<p style="text-align: right;">Page 305</p> <p>1 deposition and this deposition? 2 MR. BRALY: No, Chris. It's just a 3 central stop dispersion staining table. 4 MR. PLACITELLA: I can't see it. 5 That's why I'm asking. 6 MR. HYNES: Yeah, these are just -- 7 yeah, basically, he took his table from that 8 publication he carried in with him. 9 MR. PLACITELLA: Okay. Got it. 10 MR. HYNES: And he put an ISO color 11 bar. 12 THE WITNESS: Can you show this on 13 the screen? 14 MR. BRALY: No, we're fine. 15 MR. HYNES: It will be marked as an 16 exhibit, and we'll mark this handwritten set of 17 stuff as 46. 18 THE WITNESS: Okay. 19 MR. HYNES: And that's it. 20 Questioning? 21 MR. BRALY: Yeah, briefly. 22 REDIRECT-EXAMINATION BY MR. BRALY: 23 Q. Dr. Su, you're almost through here. 24 Congratulations. You survived your first 25 deposition.</p>
<p style="text-align: right;">Page 304</p> <p>1 documented in MAS micrograph, the photo. Because 2 the value indicate the alpha and the gamma value is 3 totally different from the Calidria chrysotile. And 4 the birefringence, the number one sample is .03, or 5 13. The rest is 6. The range value is .017 to 6 .019, which is completely -- which is out of the 7 range of any chrysotile, let alone the Calidria. 8 The Calidria birefringence is .005. 9 Every sample in this exhibits is way 10 above that. They range from 1.013 to .019, whereas 11 the Calidria chrysotile is .005; therefore, none of 12 this minerals, they are Calidria chrysotile. 13 Q. Looks like there's one more thing 14 that you, I guess, brought with you. It's this one 15 page -- 16 A. Okay. Yeah, I summarized that. 17 Q. I guess we have a one-page sheet. 18 A. Yeah. Just from Exhibit 32. 19 Q. Okay. I guess, for the record, we 20 should mark 45, we'll mark those four tables you 21 made; and then 46, we'll mark the one-page sheet. 22 And then it looks like you put Post-Its on 23 Exhibit 32, so we'll mark that all as one. 24 MR. PLACITELLA: Just for 25 clarification, the tables were created between last</p>	<p style="text-align: right;">Page 306</p> <p>1 Using the Becke line analysis to 2 complement dispersion staining is something that you 3 have never published until 2023, correct? 4 A. Yes. 5 Q. That is correct? 6 A. That's correct. 7 Q. Great. 8 Nowhere in your report, which is 9 Exhibit 3 to this transcript -- nowhere in your 10 report did you criticize how Dr. Longo calculated 11 his birefringence, correct? 12 A. I think I did. 13 Q. No, you didn't, actually. And if you 14 want to -- we can go to Exhibit 3, probably present 15 this to you pretty easily. 16 A. Which page? 17 Q. Well, give me a second. We're going 18 to do this on the screen here. 19 Here we go. If you take a look at 20 the screen in front of you. 21 A. Yes. 22 Q. So, this is your report, Exhibit 3. 23 It's 99 pages long, right? 24 A. Yes. 25 Q. If you do a word search for the word</p>

<p style="text-align: right;">Page 307</p> <p>1 "birefringence," it appears three times in this 2 entire document. 3 Sir, if you'll pay attention to the 4 screen, please. 5 A. Okay. 6 Q. It appears three times. The first 7 time it appears twice in one paragraph on page 3, 8 the word "birefringence." 9 Sir, can you please pay attention to 10 the screen? 11 A. Yes. I will find it on hard copy. 12 Q. I'm telling you. It's page 3 of your 13 report. 14 A. It's easier for me to read from this 15 color copy. 16 Q. Okay. 17 A. Page 3. Yes. 18 Q. And what you're saying is that if you 19 have the wrong RI value, that you will get a subdued 20 birefringence value, correct? 21 A. Correct. 22 Q. Meaning that the relationship between 23 RI is a relationship to the resulting birefringence 24 calculation? 25 A. Correct.</p>	<p style="text-align: right;">Page 309</p> <p>1 Paragraph 3. 2 A. That's right. 3 Q. Yes. 4 What I'm asking is: You never 5 criticized the method by which it was calculated in 6 Dr. Longo's -- you never discussed that in your 7 report, correct? 8 A. I don't have to -- 9 Q. Just answer my question. You don't 10 discuss that in the report, correct? 11 A. No. 12 Q. Thank you. 13 Your 2021 NVLAP review, the review 14 that was done by Bo Li that you had comments about. 15 A. Yeah. 16 Q. Do you have documents pertaining to 17 this NVLAP review? 18 A. You see, the review was done on the 19 portal of the NVLAP. So first they assign me to 20 review -- 21 Q. Sir, I am just asking you: Do you 22 have documents relative to the 2021 -- 23 A. That's what I'm answering. 24 Q. Okay. 25 A. It is document in the portal of the</p>
<p style="text-align: right;">Page 308</p> <p>1 Q. Okay. So you mentioned the word 2 "birefringence" two times in this one paragraph in 3 Exhibit 3? 4 A. Yes, I did. 5 Q. Now, if you'd pay attention to the 6 screen. 7 A. Okay. 8 Q. The only other time "birefringence" 9 appears in your report is in your bibliography, in 10 an article from 1989. 11 Do you see that? 12 A. Yes, I do. 13 Q. The word doesn't appear in your 14 report in any other location. So, it is a true 15 statement that you never articulate a criticism of 16 the method by which birefringence was calculated by 17 Dr. Longo, correct? 18 THE WITNESS: Can I answer now? 19 MR. HYNES: Yeah. 20 BY MR. BRALY: 21 Q. I mean, it's a yes-or-no answer. 22 A. My answer is: The birefringence is a 23 secondary product -- property. It was determined by 24 the primary property after refractive index. 25 Q. I agree. And that's what you said in</p>	<p style="text-align: right;">Page 310</p> <p>1 NVLAP. 2 Q. Do you have access to that portal? 3 A. Of course I have access as assessor. 4 Q. I mean, is that something that you 5 can download from the portal and -- 6 A. No, we are not allowed to download 7 it; we can only write input in the portal. And 8 also, like once I finish my review, then the MAS, 9 the target lab will be able to see my comments in 10 the portal. 11 Q. Okay. 12 A. We are not allowed to print or 13 download that. 14 Q. So, your comments, if I understood it 15 correctly, was that Bo Li recognized an error had 16 been made relative to the assignment of alpha and 17 gamma values? 18 A. Correct. 19 Q. And that Bo Li, who was the analyst 20 who had done that review, said essentially that this 21 was a isolated mistake and shouldn't affect prior 22 studies, or something to that effect, and you 23 disagreed with that? 24 MR. HYNES: Misstates testimony. 25 A. No, no, no. It's not Dr. Bo Li. It</p>

<p style="text-align: right;">Page 311</p> <p>1 is MAS --</p> <p>2 Q. No, I understand that. I'm sorry.</p> <p>3 Let me re-ask the question, then.</p> <p>4 A. Okay.</p> <p>5 Q. Was it Bo Li -- that's a woman,</p> <p>6 correct?</p> <p>7 A. No.</p> <p>8 Q. Bo Li's not a woman?</p> <p>9 A. A man.</p> <p>10 Q. I'm sorry. So, Bo Li did a review,</p> <p>11 and is it correct that he concluded that this was an</p> <p>12 isolated error that should not affect prior reviews,</p> <p>13 and you disagreed with that?</p> <p>14 MR. HYNES: Misstates testimony.</p> <p>15 A. I don't think you express that</p> <p>16 correctly.</p> <p>17 Q. Okay. Please do.</p> <p>18 A. Let me say.</p> <p>19 Q. I appreciate it.</p> <p>20 A. First, Dr. Bo Li did the assessment</p> <p>21 by remote, because during pandemic he could not</p> <p>22 physically present at the lab; however, he identify</p> <p>23 we don't use isolate or not, we only use its</p> <p>24 nonconformity or not. So, nonconformity means in</p> <p>25 this requirement what the lab did, did not comply</p>	<p style="text-align: right;">Page 313</p> <p>1 isolate incident.</p> <p>2 Q. It was a nonconformity from one</p> <p>3 evaluation?</p> <p>4 MR. HYNES: Can we go off the record</p> <p>5 for one second?</p> <p>6 MR. BRALY: Yes, it'll be fine.</p> <p>7 (Discussion held off the record.)</p> <p>8 BY MR. BRALY:</p> <p>9 Q. Dr. Su, I just want to understand</p> <p>10 this issue a little bit better because I don't have</p> <p>11 the access to the documents that you do. Okay? So</p> <p>12 you're saying that there was a comment made about a</p> <p>13 nonconformity --</p> <p>14 A. Excuse me. Could you repeat the</p> <p>15 question, please?</p> <p>16 Q. Yeah; I just want to understand.</p> <p>17 So, there was a review of the lab,</p> <p>18 right?</p> <p>19 A. To be exact --</p> <p>20 Q. No, no, no. I'll re-ask it.</p> <p>21 A. No.</p> <p>22 Q. I don't want a long answer. Let me</p> <p>23 try to understand this: There was a nonconformity</p> <p>24 found with the lab, right?</p> <p>25 A. By the assessor.</p>
<p style="text-align: right;">Page 312</p> <p>1 with the requirement by NVLAP; therefore, it was</p> <p>2 identify as nonconformity.</p> <p>3 Q. Okay.</p> <p>4 A. So, after his assessment, the lab,</p> <p>5 all they need to do is to look at are there</p> <p>6 nonconformity or not; if there are, they are</p> <p>7 required to respond to NVLAP. Okay. Whether</p> <p>8 there's nonconformity is how they are going to</p> <p>9 correct that, the corrective action, also the cause</p> <p>10 of the root cause analysis, why I made this mistake.</p> <p>11 The third thing they need evaluate,</p> <p>12 whether this has impact to the past analysis. If it</p> <p>13 is, the lab is supposed to inform the customer of</p> <p>14 previous analysis about the impact, the mistake they</p> <p>15 made. Yeah, that is the NVLAP procedure and the</p> <p>16 policy.</p> <p>17 Q. Okay. So if you're going to answer</p> <p>18 my question, I would appreciate it.</p> <p>19 Did Dr. Bo Li find -- I mean, was</p> <p>20 this ruled to be an isolated incident?</p> <p>21 A. Dr. Bo Li --</p> <p>22 Q. Just answer my question: Was this an</p> <p>23 isolated incident? Was that the determination of</p> <p>24 NVLAP?</p> <p>25 A. No, it is nonconformity; it's not</p>	<p style="text-align: right;">Page 314</p> <p>1 Q. Okay. And then there was a report</p> <p>2 issued, correct?</p> <p>3 A. What do you mean, "report issue"?</p> <p>4 Q. What happened after the nonconformity</p> <p>5 was found?</p> <p>6 A. The lab has 30 days to respond to</p> <p>7 NVLAP.</p> <p>8 Q. Did they respond?</p> <p>9 A. They did.</p> <p>10 Q. Okay. And did you, in turn, issue</p> <p>11 your own comments in response to MAS's initial</p> <p>12 response?</p> <p>13 A. Yes, I did.</p> <p>14 Q. Okay.</p> <p>15 A. I was assigned by NVLAP to review</p> <p>16 their response.</p> <p>17 Q. Okay. And it's your review of the</p> <p>18 response where you are saying, in your opinion, that</p> <p>19 calls into question everything that they've done by</p> <p>20 PLM up to that point, correct?</p> <p>21 A. Only for that specific nonconformity.</p> <p>22 Q. Okay. And that specific</p> <p>23 nonconformity was -- how would you characterize that</p> <p>24 nonconformity again?</p> <p>25 A. They switch the alpha and the gamma</p>

<p style="text-align: right;">Page 315</p> <p>1 in their bench sheet. Of course that affect the 2 report. 3 Q. Sure. 4 And they switched alpha and gamma in 5 a report in the bench sheet, correct? 6 A. I am not Dr. Bo Li. If it's only in 7 one bench sheet, you are not supposed to identify 8 that nonconformity. It is a nonconformity-ing in 9 any of their bench sheets. 10 Q. Doctor, here's the problem I have: 11 You've reviewed probably close to a dozen PLM 12 reports by MAS where gamma is in excess of alpha in 13 their values. They clearly did not switch them. 14 A. Which report? 15 Q. Any of the dozen or so 16 Johnson & Johnson PLM reports that you've reviewed. 17 A. After that. 18 Q. Well, a lot of those were dated 19 before '21; were they not? A few of them? 20 You didn't notice in any of the 21 Johnson & Johnson reports that MAS had flopped the 22 gamma value and the alpha value such that alpha 23 exceeded gamma, correct? 24 A. No, because I was asked to review the 25 assessment report in 2021; therefore, I only review</p>	<p style="text-align: right;">Page 317</p> <p>1 assumes facts. 2 A. Well, the only conclusion about that 3 particle is by their own data. See, they document 4 that refract index of each particle, and those value 5 don't conform to Calidria chrysotile. 6 Q. I 100 percent understand what you're 7 trying to say, 100 percent get you. 8 A. Okay. 9 Q. My question to you is: If the only 10 substances in the mixture being looked at are 11 bentonite clay and asbestos, then what is it? Do 12 you have any idea what that particle is that appears 13 in those images? 14 MR. HYNES: Same objections. 15 A. If I am asked to make a determination 16 because their data showed it is not; however, if I 17 was asked to confirm whether the identification is 18 correct or not, whether it is the Calidria 19 chrysotile, I would have to analyze the sample 20 myself. 21 Q. So, you don't know what it is? 22 A. Before I examine that. 23 I only know that from their report. 24 From their report, it's not. 25 Q. Right.</p>
<p style="text-align: right;">Page 316</p> <p>1 their response to the nonconformities identified by 2 Dr. Bo Li. It's nothing to do with their talc 3 Johnson & Johnson Baby Powder analysis. 4 Q. I'm counting up more than a dozen 5 reports prior to March of 2021 that are on your 6 Exhibit B that you reviewed, PLM reports that MAS 7 did. 8 I just want to make sure I'm clear 9 about this. You are not saying that in any of those 10 reports that MAS made a systemic mistake of flopping 11 alpha and gamma, correct? 12 A. Correct. 13 Q. Okay. That's all I needed to check. 14 A. Okay. 15 Q. As it relates to the bentonite issue, 16 if the only two mixtures in that sample were 17 bentonite and Calidria talc -- that's terrible. 18 Look at me making mistakes. I'm making mistakes. 19 Going back to the bentonite sample, 20 if the only two mixtures in that sample are 21 bentonite clay and Calidria asbestos -- 22 A. Okay. 23 Q. -- what is the particle that's in 24 those images, if not asbestos? 25 MR. HYNES: Incomplete hypothetical;</p>	<p style="text-align: right;">Page 318</p> <p>1 Wouldn't it -- I mean, so, let's talk 2 about the scientific method for a moment. All 3 right? 4 A. Okay. 5 Q. If you're coming to -- if you're 6 wanting to figure out the refractive index of a 7 previously uncategorized mineral. Okay? 8 A. Okay. 9 Q. And you have a known sample of that 10 mineral, and you conducted an analysis to figure out 11 what the refractive index of that mineral would be. 12 A. Yes. 13 Q. That's how you figure these things 14 out, correct? 15 A. Yes. 16 Q. Okay. So, if the only two options of 17 what is in that bentonite mixture is some mineral 18 and bentonite, whatever the mineral is in that 19 mixture is what is being evaluated and reported, 20 correct? 21 A. Correct. 22 Q. Okay. You're saying it can't be 23 chrysotile because of other data showing a lower 24 value for refractive index, correct? 25 A. Let me clarify. I know your</p>

<p style="text-align: right;">Page 319</p> <p>1 question, because there are only two components: 2 One is SB 210 chrysotile, and the other is a 3 bentonite. If it's not bentonite, what else it 4 could be, right? 5 Q. That's my question. 6 A. Yes. That's a very good question. 7 Q. Thank you. 8 A. It all come down to very basic 9 question, the test method -- whether you can 10 correctly perform the test method. If MAS is 11 capable, correctly perform the refract index 12 measurement, it is the first criticism in my MDL 13 report, as said, incorrect refract index 14 measurement. 15 Again, this report showed they are 16 incapable of correctly perform that procedure. If 17 they could, then they would not make the mistake. 18 The refract index should be correctly measured, 19 documented. 20 Q. Okay. When did you and Mr. Hynes get 21 together to talk about your testimony relative to 22 the bentonite clay issue? 23 A. No, we have not talk about that. 24 Q. Come on, now. 25 A. No.</p>	<p style="text-align: right;">Page 321</p> <p>1 value. 2 MR. BRALY: I know. It's fine. I 3 want to make sure we have a record of what it is he 4 tabbed. 5 With that, I can pass the witness. 6 MR. HYNES: Give me -- 7 MR. PLACITELLA: I've got a couple of 8 minutes. 9 MR. HYNES: Okay, Chris. Go. 10 RE-CROSS-EXAMINATION BY MR. PLACITELLA: 11 Q. I know I'm standing between everybody 12 and lunch, so, I'll try to be two minutes. 13 Can we go back to Exhibit 42, please. 14 That's the exhibit I was asking you about before. 15 MR. BRALY: 42 is the exhibit about 16 wet-sieved talc. 17 MR. PLACITELLA: Oh, what's the 18 one -- 19 MR. BRALY: If you're looking for the 20 J4-1, that's 44. 21 MR. PLACITELLA: 44. Give me 44, 22 please. 23 BY MR. PLACITELLA: 24 Q. Let me know when you have it in front 25 of you.</p>
<p style="text-align: right;">Page 320</p> <p>1 Q. Come on. You've been so 2 straightforward with me for the last couple days. 3 You guys didn't talk about your 4 bentonite clay opinions before you came in here? 5 A. You see, I only got this formal copy 6 yesterday. And when I looked at, the first thing I 7 check is all the information in this exhibits. 8 Q. Yeah. 9 A. I am fully capable to form my 10 opinion. I don't have a consult with anyone. You 11 see, this a very simple task, whether this 12 micrograph showed it is Calidria chrysotile, because 13 my answering last time it was, now I realized it was 14 not. 15 Q. Okay. 16 A. You see, I don't -- really don't have 17 to consult with anyone about this. 18 Q. All right. 19 A. Okay? Yeah. 20 MR. BRALY: Kevin, are the tabs that 21 are on that, are you including that as part of what 22 you're producing? 23 MR. HYNES: We should. It looks 24 like -- 25 THE WITNESS: I just write down the</p>	<p style="text-align: right;">Page 322</p> <p>1 MR. HYNES: He has it in front of 2 him. 3 A. Yes. 4 Q. Remember, this was the document you 5 went through that you said should not be used to 6 determine whether there's asbestos in talc. 7 Do you recall that? 8 MR. HYNES: Objection; misstates 9 testimony. 10 A. Could you say the question again? 11 Q. This is the document we spent some 12 time on before, what you said should not be used to 13 determine if there's asbestos in talc as a 14 specification. 15 You had problems with it, right? 16 MR. HYNES: Same objection. 17 A. That page is for amphibole. Okay? 18 Page 7 is asbestiform amphibole mineral by optical 19 microscopy and dispersion staining. 20 Q. Okay. 21 A. I think it's not applicable to 22 determine amphibole. 23 Q. Okay. Mr. Hynes asked you a question 24 about you don't know how long the specification that 25 you're critical of was in effect.</p>

<p style="text-align: right;">Page 323</p> <p>1 Do you recall that, him asking you</p> <p>2 that question?</p> <p>3 A. No, I don't. I don't know which year</p> <p>4 it is, so, put out, so --</p> <p>5 Q. Can you go to the very first page.</p> <p>6 A. Okay.</p> <p>7 Q. All right. Now go to the second</p> <p>8 page.</p> <p>9 A. Hold on. Okay.</p> <p>10 Yes.</p> <p>11 Q. See where it says "copyright 1971"</p> <p>12 all the way through 1990?</p> <p>13 A. Correct.</p> <p>14 Q. Does that give you some information</p> <p>15 about how long this specification, or some version</p> <p>16 of it, was being used?</p> <p>17 A. Correct.</p> <p>18 Q. That's all the questions I have.</p> <p>19 Thank you.</p> <p>20 MR. BRALY: I think you might be</p> <p>21 through.</p> <p>22 Mr. Garde, do you have any questions?</p> <p>23 MR. HYNES: I don't think Mr. Garde</p> <p>24 has any questions. All right. Let's go off the</p> <p>25 record.</p>	<p style="text-align: right;">Page 325</p> <p>1 CERTIFICATE OF OFFICER</p> <p>2</p> <p>3 I CERTIFY that the foregoing is a true</p> <p>4 and accurate transcript of the testimony and</p> <p>5 proceedings as reported stenographically by me at</p> <p>6 the time, place and on the date as hereinbefore set</p> <p>7 forth.</p> <p>8 I DO FURTHER CERTIFY that I am neither</p> <p>9 a relative nor employee nor attorney or counsel of</p> <p>10 any of the parties to this action, and that I am</p> <p>11 neither a relative nor employee of such attorney or</p> <p>12 counsel, and that I am not financially interested in</p> <p>13 the action.</p> <p>14</p> <p>15 </p> <p>16 -----</p> <p>17 ANDREA NOCKS, CCR, CRR</p> <p>18 Certificate No. X100157300</p> <p>19 Certificate No. XR00011300</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p>
<p style="text-align: right;">Page 324</p> <p>1 (Deposition adjourns: 12:58 p.m.,</p> <p>2 Eastern Standard Time.)</p> <p>3</p> <p>4</p> <p>5</p> <p>6</p> <p>7</p> <p>8</p> <p>9</p> <p>10</p> <p>11</p> <p>12</p> <p>13</p> <p>14</p> <p>15</p> <p>16</p> <p>17</p> <p>18</p> <p>19</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p>	

[& - 21]

Page 1

&	1.55 233:3 234:3 1.55. 230:1 1.550 234:2 302:1 303:5 1.550e 302:15 1.556 292:12 1.560 302:2,25 303:6 1.60. 229:23 1.605. 274:1 1.65 229:23 1.7 241:7 10 191:5 213:10 213:12 237:8 242:11 255:2 100 192:12 266:3 317:6,7 1000 195:23 257:12 10036 192:10 101 219:9 10613 325:14 108 219:23 10:11 234:24 10:18 234:24 10:54 256:13 11 220:21,21 248:6,8 110 220:20 112 221:5 1185 192:9 11:04 256:13 11:59 286:21 12 238:7	127 192:19 12:06 286:21 12:58 324:1 13 212:19,20,22 217:16,20 301:17 304:5 13.4 248:15 14 208:14,17 213:23,24 15 263:15 16-2738 190:3 17 208:18 210:15 212:19 213:23 18 191:6 241:7 1866 233:4 235:18,25 289:15 292:8,9 1866a 292:9 1866b 292:9 1886 235:17 1930s 206:17 225:22 1967 224:15,16 197,305 194:6 1971 323:11 1976 299:10 1977 299:10 1989 308:10 1990 323:12	2.1 238:21,25 239:2 240:12 2.1. 239:13 2.7 237:24 20 250:4 263:15 2003 204:21 205:14 2005 195:10 216:20 2015 209:23 2016 195:7 207:13 209:2 209:17,23 211:6 213:20 293:21 294:2 294:22 295:14 295:17,19 2020 248:10 2021 295:20,20 296:1 297:8 309:13,22 315:25 316:5 2022 217:25 218:11 295:21 301:12 302:17 2023 195:20 218:23 219:5,8 222:3,13 223:9 237:4 306:3 2024 191:6 248:10 303:11 204 195:6 207 195:8 208 195:9 21 239:15,18,22 240:1 302:16
& 190:5,18 192:8,11,14,18 193:2,9 251:22 279:24 280:9 280:18 281:1 281:13 282:15 283:3 294:5,19 315:16,21 316:3			
0			
0.05. 229:22 000017 253:15 254:24 001 237:23 002 241:6 003 248:17 003809-18as 190:11 005 304:8,11 01 248:18 249:7 017 304:5 019 304:6,10 03 304:4 07102 192:13 07701 192:20 08002 193:11			
1			
1 239:11 248:22 250:14 1.013 304:10 1.50 230:1 1.549 292:12		2	
		2 209:9,11 210:5,11 273:4 284:4,24	

[21 - a.m.]

Page 2

315:19 210 195:23 196:3 258:7 319:2 216 195:10 218 193:4 219 195:15 21st 303:11 22 288:22 22262-1 287:19 289:1,3,7 225 195:17 227 195:19 236 195:22 24.2 248:15 25 243:12 256 195:24 196:13 258 196:4 259 196:5 26 263:17,19,20 263:21 260,321 194:7 27 263:17,19,20 263:21 264:4 28 241:2 287 194:8	3.4 209:20 30 229:6,10,11 236:17 314:6 300 192:3 302 192:3 304 196:6,8 310 193:11 32 196:8 301:22 301:23 303:18 303:21 304:18 304:23 34 195:3 204:19 34th 192:9 35 195:7 207:12 36 195:9 208:24 209:9 210:15 36104 193:4 37 195:10 216:22 38 195:11 219:7 39 195:16 225:9 225:10	43 196:3 258:6 44 196:5 259:25 272:15 321:20 321:21,21 45 196:6 243:11 304:20 46 196:7 304:21 305:17 46.7 245:14 246:3	71095 247:19 71940 247:19 72 252:16 253:4 73 255:21 75202 192:4 763 212:9 79 261:21
		5	8
		5 195:20 237:4 255:1 5.3 210:19 5.3.2 210:23 5.4.1 212:6 5.9 212:23 5.9.1 213:9 5.9.5 213:22 5.9.5. 213:25 50 236:18 255:19 53 217:21,24 218:3	8 212:3 814 246:2 81814 245:17 83 225:7 83.5 233:5 86 234:11 86.5 233:3,8 87 234:11
	4	6	9
	4 237:18 40 195:18 212:9 222:4 227:4,7 236:18 269:15 280:24 400 258:3 41 195:20 236:25 237:4 237:19 292:15 42 195:23 256:25 321:13 321:15	6 210:16 304:5 6500 196:3 258:7,11	9 195:7 207:13 220:21 221:1 90 252:3 92 252:16 93 287:18 288:19,21 95 254:11 99 249:16 251:11 306:23 99.9 248:20 249:1,5,11 250:11,24 9:12 191:7
3		7	a
3 193:10 216:8 243:12 248:5,6 252:16 253:4 263:13 306:9 306:14,22 307:7,12,17 308:3 309:1		7 210:14,15 272:25 273:1 285:8,10 298:24 322:18	a.m. 191:7 234:24,24 256:13,13

[a.m. - analysis]

Page 3

286:21 able 255:23 256:3 260:12 260:16,21 261:3,9 266:2 267:15 283:17 310:9 above 218:8 248:10 304:10 absolute 227:24 274:15 287:13 287:20 abstract 195:10 216:19,24 accept 215:3,3 access 310:2,3 313:11 accommodati... 210:20 accomplish 278:9 accordance 207:3 accredit 207:7 accreditation 207:10 211:15 215:10 accredited 206:25 207:1 297:12 accurate 195:3 204:23 230:14 237:15 238:18 280:5 325:4 accurately 270:19	acknowledg... 221:6 action 312:9 325:10,13 activities 214:4 actual 213:19 262:19,20 264:16 294:13 actually 197:9 209:13 216:18 241:23 246:1 249:25 252:12 254:2,25 255:11 258:19 289:10 295:3,5 306:13 additional 197:20 adjourns 324:1 advantages 217:5 236:3 advice 279:23 advise 279:25 aed 274:22 affect 232:22 274:23 275:23 276:19 296:7 296:15,20,24 297:1 310:21 311:12 315:1 affected 274:3 274:6,8 affecting 261:7 277:25 affiliated 224:2	afternoon 263:4,10,13 age 229:3 ago 298:5 agree 200:23 215:23 236:2 238:13 241:10 255:10 284:16 285:12 286:6 288:1 296:16 308:25 agrees 255:6 ahead 229:20 238:7 246:21 256:11 258:9 259:23 293:15 299:3 301:9 ahera 294:14 294:15 airborne 294:11 airport 263:14 al 190:18 alabama 193:4 allen 193:2 allow 254:25 allowable 252:25 allowed 255:1 310:6,12 allows 243:25 alpha 227:11 227:25 229:23 230:1,2 266:12 287:14,20 288:4 292:12	296:4,17,19 302:16 304:2 310:16 314:25 315:4,12,22,22 316:11 alternative 217:7 ambush 300:18 american 204:20 americas 192:9 amount 252:7 253:9,11,13,17 254:3 264:3,5 amphibole 271:14,25 272:7 273:18 275:15 285:8 285:10,11 286:11 299:7,9 322:17,18,22 amphiboles 269:12 271:7 284:4,17,19 analyses 294:17 297:6 analysis 195:20 201:7,8 205:17 206:7,8 207:2 208:4,4 213:5 215:25 216:12 218:9 221:3 226:13 236:21 237:5 253:7 254:4 262:4 263:18,20,22
--	---	---	---

[analysis - asked]

Page 4

265:25 266:20 268:9 271:11 271:13,19 272:1,8 273:4 277:20,23 280:6 289:19 289:22,23 290:1,8,12 291:19 292:16 294:11,12,15 296:7,15 298:17,23 301:15 306:1 312:10,12,14 316:3 318:10 analyst 205:12 205:23,25 206:19 216:2 218:16 221:2 243:25 246:16 266:18 275:25 278:1 284:13 290:9,25 310:19 analytical 197:21 211:2 266:1 283:11 analyze 218:17 254:11 268:20 317:19 analyzed 253:10 291:21 292:23 293:7 293:12 analyzes 265:23	analyzing 228:5 253:17 andrea 191:2 325:16 angle 231:9,18 232:22,23,24 232:24 233:3,6 233:7 234:11 234:20 annular 219:14 219:19 answer 202:13 205:9,19,21 210:3 220:16 222:9 240:16 240:19 245:2,5 253:23 281:22 281:24 303:22 308:18,21,22 309:9 312:17 312:22 313:22 answered 267:10 270:10 279:7 293:18 303:20 answering 202:14 240:17 309:23 320:13 anybody 255:2 anymore 282:11 288:14 anyway 275:13 apereo 256:20 apologize 278:12 300:21	apology 300:23 apparatus 275:3,8 appear 308:13 appears 200:21 307:1,6,7 308:9 317:12 applicable 224:6 322:21 application 215:24 301:13 apply 258:15 294:14 appreciate 203:8 287:7 311:19 312:18 appreciated 221:12 approved 215:16 area 244:1 arrived 262:23 263:2 article 200:22 204:19 217:25 218:24 308:10 articles 204:15 articulate 308:15 asbestiform 269:7,9 271:6 271:14,25 272:8 273:4 275:11 285:8 286:11 298:17 322:18	asbestos 195:6 195:16 202:4,9 204:25 210:25 211:1 212:8 218:9 224:24 233:18,24 268:9,10,14,18 268:20 269:1 269:24 270:3,8 270:11,13,16 270:20 273:18 273:22,24 274:10,15 275:14 276:4 277:4 278:18 279:4,25 280:10,19 281:2,14 282:16,22 283:4,11 286:3 288:24 292:7 294:11,12 295:11 299:20 301:14 316:21 316:24 317:11 322:6,13 asked 202:10 210:5 240:8 251:19 259:23 267:10 270:9 271:10 272:3,5 279:6 280:13 280:15 289:18 291:15 293:20 297:15 303:18 315:24 317:15
---	---	--	--

[asked - becke]

Page 5

317:17 322:23 asking 202:18 203:5,9 209:25 210:1,4,9 240:11 255:7 259:8 272:5 278:23 280:16 280:22 281:7 281:10 305:5 309:4,21 321:14 323:1 aspect 239:25 269:4 279:8,11 279:22 assess 207:22 283:10,13 294:13 assesses 295:2 assessing 207:24 218:4 assessment 195:8 207:6,8 207:14 208:6 215:5,5 277:13 294:9 295:7,19 295:20,22 296:21 311:20 312:4 315:25 assessor 214:25 215:3,4,4,8 293:24 295:2,3 295:6 296:13 310:3 313:25 assessor's 213:15 215:1 295:14	assign 215:8 290:4 295:24 309:19 assigned 314:15 assigning 283:3 assignment 310:16 associated 236:16 assumes 317:1 assurance 214:4 assurances 236:10 assure 280:3 assuring 212:25 astm 202:8 atoms 292:1 attached 208:13,19 attain 252:24 attention 301:4 307:3,9 308:5 attorney 325:9 325:11 attorneys 192:4 192:13,20 193:5,12 audit 294:25 295:1 authored 256:17 available 243:22 299:24	avenue 191:5 192:9,19 aware 220:5,10 226:13 236:20 236:23 252:1,4 294:7 297:8 axis 228:16,17 228:17 b b 195:1 196:1 316:6 baby 247:24 248:2,19,25 249:4,9,11,15 250:11,23 251:2,20,24 283:12 294:20 316:3 back 209:8 212:17 215:19 316:19 321:13 bad 287:1 bandli 221:14 221:21 222:5 222:14 223:10 223:20 238:4 241:15 bank 192:20 bar 239:1,1,7 246:13,14,24 302:19 305:11 bars 243:16 base 246:25 based 201:15 205:14 211:20	212:16 214:22 214:24 215:11 235:16 244:16 245:12,17,18 245:18 246:23 249:10,12 261:10 269:15 269:17,18 272:5 303:25 basic 254:12 296:16 319:8 basically 305:7 basing 246:1 beasley 193:2 beat 286:25 becke 195:11 198:1,13,20,21 198:25 199:1,8 199:9,23,25 200:3,4,11,21 200:25 201:6 204:8 205:5,5 205:16 206:5,8 206:15,18 215:19,24 216:12 217:2,6 218:6,15,20,24 220:1,11 221:2 221:9 226:12 261:21 262:4,7 263:22,25 264:3 271:12 271:19 272:1,8 286:9 289:19 289:21 290:1,7 290:15,18,20
--	---	---	--

[becke - calidria]

Page 6

291:4,13 306:1 behalf 208:5 believe 204:5 205:15 215:25 218:1 220:22 236:12 241:4 259:18 294:1 299:17 ben 272:10 286:18 bench 296:18 315:1,5,7,9 benjamin 192:2 bentonite 303:19 316:15 316:17,19,21 317:11 318:17 318:18 319:3,3 319:22 320:4 bertrand 275:4 best 233:17 241:21 264:2 278:21 better 313:10 beyond 250:14 298:23 bibliography 308:9 big 256:9 bigger 227:6 241:19 272:20 bill 278:25 billed 264:12 279:1 biography 215:2	birefringence 226:22 227:10 227:18,23 228:4,11 229:4 229:12,16,17 229:22 230:6 287:13,19 304:4,8 306:11 307:1,8,20,23 308:2,8,16,22 bit 198:1 271:3 313:10 bits 258:21 blanks 210:25 bloss 287:19 blue 233:2,7,9 234:12 bo 295:20,22 296:3,20 309:14 310:15 310:19,25 311:5,8,10,20 312:19,21 315:6 316:2 border 201:24 203:16 borders 225:13 226:7 bottle 248:3 253:16 bottom 207:17 246:12 248:8 255:21 braly 192:2 194:6 197:4 203:13 234:21	235:1 256:15 257:8 259:15 259:18,22 260:2 271:19 272:12,15,19 293:14 302:3 305:2,14,21,22 308:20 313:6,8 320:20 321:2 321:15,19 323:20 branham 192:2 break 226:19 234:21 259:20 briefly 204:16 215:20 305:21 brightness 261:15 bring 301:3,10 303:8,15 bringing 300:17 broke 227:5 brought 220:23 300:4,12 301:6 301:16,20,24 303:10 304:14 brunswick 191:5 286:25 bryan 221:14 221:21 222:5 222:14 223:10 bulk 212:8 218:9 294:10 295:10	bundle 232:7,9 232:20 233:11 233:16 234:18 237:21 238:14 238:16 241:11 291:16,19 292:13 bundled 231:25 c c 192:1,11 193:1 196:1 197:1 213:4 calculate 227:18 245:15 264:15 calculated 306:10 308:16 309:5 calculating 230:4 calculation 198:2 254:5,14 254:16,17 255:2,12,18 307:24 calibrate 233:19 234:2 266:15,18 276:21 calibration 212:5 213:1 274:5 calidria 195:22 235:20,25 236:21 237:5
---	--	--	---

[calidria - cite]

Page 7

238:9 241:3,15 242:10 303:20 303:23 304:3,7 304:8,11,12 316:17,21 317:5,18 320:12 california 274:16 call 291:4 called 198:12 199:18 200:3 204:23 210:19 212:23 223:16 224:24 225:22 256:19 267:24 268:22 calls 205:18 276:14 280:11 283:7,25 314:19 campus 193:10 capable 207:25 279:3 280:4 281:25 282:5,8 282:14,17,18 282:20 283:22 319:11 320:9 capture 244:1 carbonates 252:7 care 193:12 216:23 career 250:4 cargille 233:20 302:1,2,15	carried 305:8 cars 252:14 case 197:22,23 216:6 234:13 254:16 260:23 261:17,20 294:6 cases 206:3 236:17 cause 197:17 199:24 312:9 312:10 ccr 325:16 celsius 302:17 center 192:12 254:9 central 199:18 200:11 203:1,4 219:14,19 262:14 264:6 273:23 275:23 277:13,25 279:9,11,14,17 289:22,25 290:3,10,11,19 290:25 291:18 298:22 299:20 305:3 certain 236:3 249:22 certificate 191:4 325:1,16 325:17 certification 211:11	certified 191:2 191:3 certify 325:3,8 cfr 212:9 change 200:8,8 229:15 231:11 231:13 291:20 292:4,5,13 changing 226:15 231:14 characteristics 199:9 characterize 314:23 charge 264:8 chart 195:18 202:23 224:16 227:8,16,16,19 227:20,23 228:7 229:2,13 229:14 230:2 230:11 302:10 charts 226:18 226:21 227:18 228:15,18 303:16 check 316:13 320:7 checklist 211:16 214:16 chemical 236:5 236:12 291:25 cherkasov 225:22 cherry 193:11	chicago 221:22 222:1 chris 259:15 305:2 321:9 christopher 192:18 chrysotile 233:4 235:11 235:12,18,20 236:16 237:23 238:14,15 241:6,22 242:1 248:17 249:6 249:16 251:8 251:13,17 252:9 268:12 268:14,15,17 268:20 271:11 271:20 275:15 277:7 283:12 285:13 287:24 288:20 289:4,9 292:7,12,16 294:19 296:5 297:6 301:25 302:1,15 303:20,23 304:3,7,11,12 317:5,19 318:23 319:2 320:12 chun 190:16 194:4 cite 224:17 288:25
---	--	--	---

[cited - conceptually]

Page 8

cited 287:18	227:20 233:23	comments	completely
clarification	234:5,14 261:7	213:6,7,13,16	199:24 200:16
282:23 304:25	263:24 264:7	213:19,20	217:11 277:5
clarify 284:2	266:16,19	214:12 296:24	304:6
318:25	273:23,25	297:4 309:14	completing
clark 190:14,14	274:2,3,5,6,8	310:9,14	295:6
197:22	274:11,18,21	314:11	compliance
clause 209:20	274:23 275:1	commerce	214:16
clay 316:21	275:18,21,24	193:4	complied 212:1
317:11 319:22	276:7,17,19,21	commercial	comply 207:25
320:4	276:23 277:11	218:10	213:10 311:25
clear 202:3	277:14,25	commercially	component
209:19 228:8	278:3,4 279:10	299:24	232:19 234:14
316:8	279:17,18	commissioned	249:8 251:7,7
clearly 256:6	286:8 290:4,20	277:18 278:19	254:13 273:24
315:13	290:22,23	280:8	274:10
client 294:16	291:9,10,11,12	common	components
close 256:12	299:16,21	201:11 218:4	251:11,13
315:11	302:10,19	communicate	319:1
closely 198:22	305:10 307:15	242:20	composition
cohen 192:18	colored 226:7	compare	236:5,8,12
collaborated	coloring 201:25	202:23 220:1	291:25,25
222:4	colors 198:19	227:20	comprehension
collaboration	221:9 291:2,3	competing	250:14
222:7,11	column 302:18	216:13,17	comprehensive
colleague 209:5	come 234:1,4	complaints	280:5
collect 258:3	319:8,24 320:1	235:4	computer
color 195:18	comes 215:4	complement	227:5
198:25 199:2,4	coming 203:17	306:2	concentration
199:6,6,10	234:10 300:16	complementary	249:6,16
200:6 201:15	318:5	217:5 290:1	concentrations
201:23 202:2,3	commencing	complete	248:17
202:5,9,15,16	191:6	273:20 278:8	concept 287:12
202:22 206:2,2	comment	284:12 285:16	289:19 290:7
223:12 224:16	213:13 297:2	285:17,21,22	conceptually
225:12 227:8	313:12	295:9	228:13

[concern - correct]

Page 9

concern 294:10	conjunction 220:12	control 211:3	230:21,24
concerning 260:13 261:15	connect 292:1	convert 277:11	231:2,4,16
concert 216:18	consider 278:24	278:4	235:18 236:14
conclude 250:22	consistency 211:1	copy 237:1	236:18,19,22
concluded 311:11	consistent 235:24 240:22	272:22 295:9	237:9,10,12
conclusion 247:11 251:12	276:12	307:11,15	238:4,6,17,21
317:2	consisting 248:19 250:11	320:5	238:22,24
conditions 210:20 294:1	constant 274:22	copyright 323:11	240:13 241:11
conduct 253:7	constructive 221:15	correct 198:6	241:17 242:12
conducted 197:20 209:3	consult 320:10	198:14,15	242:16 243:7
209:16 236:20	320:17	204:14 205:7	243:22,23
318:10	consumer 252:2	207:19 209:3,4	244:3,19 246:4
conducting 221:2 300:19	containers 294:20	209:10 210:13	246:5,17,18
confidence 252:25 254:12	containing 273:18	210:21 211:7,8	247:18,22
255:3	contains 270:2	211:10,12,21	255:16,17,20
confirm 200:1	contamination 211:2	211:22 212:14	259:2 260:19
200:16 201:6	context 298:10	212:18,24	260:23,24
205:6,15 206:8	continue 219:22 220:20	213:18 214:6,7	261:1,2,5,11,12
206:22 218:15	230:10 251:6	214:19,20,21	261:18,19
270:17 271:13	301:7	215:15,18	262:4,7,8,22
317:17	continued 197:4	216:14 217:8,9	264:21 265:1,5
conform 317:5	contributions 221:7	217:12,13	265:6,7,10,11
conformity 235:6		218:1,2,12,13	266:4,5 267:9
confuse 296:4		218:17,18,22	267:16,17
congratulations 305:24		219:2,3,13,15	271:21,22
		219:16,20,21	273:19 277:2
		220:2,3,6,25	277:13 279:16
		221:3 222:5,15	282:11,12
		223:3 224:21	283:14,19,20
		225:18 226:5,6	285:18 286:14
		226:9,10,13,14	287:16,21,22
		226:23,24	288:6 289:24
		227:1,8,9,12,13	290:4,6,22
		227:21 228:5	293:1,13 294:2
		228:14,21	294:3,6,24
			296:2,23 303:3

[correct - define]

Page 10

306:3,5,6,11 307:20,21,25 308:17 309:7 309:10 310:18 311:6,11 312:9 314:2,20 315:5 315:23 316:11 316:12 317:18 318:14,20,21 318:24 323:13 323:17 corrected 253:18 corrective 312:9 correctly 203:22,25 215:22 233:8 242:10 277:8 277:10 278:3,9 279:9 284:7,8 310:15 311:16 319:10,11,16 319:18 corresponding 199:5 corresponds 202:17 cosmetic 285:3 297:7 council 193:12 counsel 265:12 292:14 325:9 325:12 count 263:23 292:15,20	296:5 counted 261:21 counting 316:4 county 190:10 261:24 couple 255:6 256:23 271:4 280:23 287:5 300:4 320:2 321:7 coupled 206:7 course 201:22 250:18 256:2 281:8 282:8 284:11 296:19 297:21 310:3 315:1 court 190:1,10 191:2,3 234:16 301:4 cover 253:19 279:8,11,12,13 279:22 285:2 create 243:16 created 304:25 criteria 247:5 269:23 286:8 295:10 critical 221:6 232:24,24 233:3,6 322:25 criticism 200:24 213:16 235:10 249:10 308:15 319:12	criticisms 295:16,25 criticize 306:10 criticized 309:5 critique 201:7 crop 244:5 cropped 244:23 245:16,19,21 247:6,8,10,15 cross 260:6 287:10 crow 193:2 crr 325:16 crystal 236:5 269:21 291:23 292:1 crystallography 284:10 csds 220:1 ctfa 273:4 285:3,6 297:16 current 245:12 currently 297:11 curvature 231:18 curves 241:25 customer 312:13 cut 229:10 d dallas 192:4 data 196:13 240:22 245:13 245:13,17	256:1,7 259:5 259:10 260:17 260:18,22 261:10,12,15 283:18,23 299:7 317:3,16 318:23 date 325:6 dated 207:12 315:18 day 220:24 261:21 262:23 263:2,3,4,7,8,9 263:9 288:18 301:17,18 daylight 274:23 275:22 days 262:18,20 262:24 263:1 264:9 280:23 287:7 300:19 314:6 320:2 deal 256:9 dean 192:2 debate 203:1 debating 203:2 decide 217:13 301:6 deeply 221:12 defendant 192:13 193:12 defendants 190:19 define 222:21 269:23 274:10
--	---	--	--

[defined - discussing]

Page 11

defined 274:9 287:20	describing 199:22 288:23	271:20,24 272:7 275:9,14	differentiate 290:21 291:12
definitive 262:3 262:6	description 195:2 196:2	282:21 284:13 286:3 290:2,17	differently 226:1 233:11
definitively 275:10	despite 260:20 261:4,8,14	291:1 299:6 322:6,13,22	difficulty 268:6 282:7
degree 232:12 233:3,5,8 234:11	detail 266:1 277:19	determined 227:10 228:4,6 234:19 291:24 308:23	diffraction 267:24 268:1,3 268:8,11,21,21 268:22,24 269:4,9,25 270:7,17
degrees 302:17	detailed 221:15 277:22 278:15 281:25	determining 198:13 199:23 217:12 226:22 270:2 283:4 289:20	digit 250:15
deliberate 300:24,24	details 279:16 285:16	develop 233:19 278:8	direct 197:4 233:13
density 293:4	detect 269:9	developed 202:23 206:18 229:2 230:11 298:10 299:15	directions 227:12
depend 274:18	determination 195:4,13 201:13 204:24 207:9 212:7 217:8 218:25 237:16 286:9 312:23 317:15	device 257:22 299:24	disagree 203:18 267:6
dependent 290:16	determine 198:5 199:10 202:24 205:24 206:16,20 210:25 211:17 214:16 215:2 215:10 216:13 217:3,14,15 218:17 220:13 227:22,24 229:12 236:7 251:23 254:13 258:24 268:25 269:4,6,20,22 270:18 271:6	difference 244:14 270:12 287:14,20	disagreed 266:7 267:2 310:23 311:13
depending 228:19 231:5		different 228:19,24,25 238:9 244:11 244:13 247:3 247:17,17,20 248:2,11 275:20,21 276:11 282:25 304:3	disagreeing 203:21
deposed 221:20			disagreement 267:21
deposition 190:14 197:23 216:8 220:24 265:9,13,16,21 279:1 281:11 287:7 288:11 288:18 292:18 300:5,13,18 301:19,23 305:1,1,25 324:1			disclosed 300:11,18
derive 279:13			discuss 201:5 205:4 309:10
describe 202:9			discussed 222:20 309:6
described 248:12 287:13 288:17 299:12			discusses 215:23
			discussing 258:25 259:4

[discussion - easily]

Page 12

discussion 203:3 215:20 260:5 282:9 313:7	298:22 299:16 299:21,23 300:1 301:12 302:10 305:3 306:2 322:19	272:11 280:1,5 298:8 300:17 301:24 302:11 303:10 307:2 309:25 317:3 322:4,11	261:11,16,24 262:15 265:9 283:17,21 287:6 288:17 294:18 295:20 295:22 296:3 296:20 297:6 297:11 299:15 299:18 301:9 302:16 303:16 305:23 306:10 308:17 309:6 310:25 311:20 312:19,21 313:9 315:6 316:2
dispersion 195:12 198:5 198:18 199:1,4 199:6 200:1,5,6 201:8,14 204:11 205:6 205:16,23 206:1,2,7,9,17 215:25 216:12 217:2,4,10 218:7,8,25 220:12,22 221:9 223:12 224:15 226:12 233:23 234:5 234:13 261:7 262:14 263:24 264:6 266:16 266:19 273:13 273:23,25 274:2,2,4 275:24 276:6 276:19,21 277:9,13,25 278:3 279:9,11 279:14,17 286:7 289:23 289:25 290:3 290:10,11,19 290:21,22 291:1,2,9,9,10 291:11,18	dispersions 195:21 237:5 displayed 266:19 274:24 275:24 278:1 291:11 distinguish 206:1,4 distort 228:23 230:20 231:4 232:7 233:11 distorted 206:2 232:13,17 233:23 234:14 274:4 290:21 291:3,11 distribution 241:14,22,25 242:4 293:11 district 190:1,2 division 190:10 docket 190:11 doctor 203:5 230:7 273:7 279:2 280:16 281:23 315:10 document 207:12 209:13 210:1,1 213:14 218:21 225:7 255:14 259:22	documented 296:3 304:1 319:19 documents 251:23 252:1 300:5,10,25 309:16,22 313:11 doing 205:16 207:20 209:17 263:18,20 264:24 288:10 download 310:5,6,13 dozen 315:11 315:15 316:4 dr 200:24 201:7 201:22 203:16 220:9 221:14 222:4 223:19 223:20 224:9 224:18,19 225:16,18,24 226:11 235:2,5 240:13,20,23 240:25 241:14 241:15 242:16 242:20,21 256:16 260:8 260:12 261:1	dry 257:21,21 due 234:15 duly 197:2 dumb 253:22 253:23 dustin 190:14 e e 192:1,1 193:1 193:1 195:1 196:1 251:4 256:20,20 earlier 260:21 283:16 early 229:3 ease 302:22 easier 257:19 307:14 easily 306:15

[eastern - existed]

Page 13

eastern 191:7 234:25 256:14 286:22 324:2 edge 201:23 233:21 edx 236:8 edxa 238:15 effect 310:22 322:25 effective 206:5 efficient 257:21 257:24 either 197:22 207:9 244:19 245:23 247:9 electron 236:3 258:13 elemental 236:8 291:24 elongation 266:12 emeritus 221:7 emphasis 301:14 emphasize 268:14 275:13 277:3 employee 325:9 325:11 enabled 261:16 ended 255:19 english 192:11 entire 200:19 218:20 243:21 244:2 246:16 307:2	entirely 228:9 entitled 218:24 243:15 246:21 environmental 210:20 218:10 epa 202:8 212:7 288:21 294:11 294:12 equal 253:1 264:5 equally 237:15 equation 254:24 equipment 266:20 error 208:12 214:9 252:25 255:1 310:15 311:12 especially 221:8 esq 192:2,8,11 192:18 193:3,9 essentially 310:20 establishing 224:6 estimate 264:2 et 190:18 etd 195:23 196:3 257:12 258:7 evaluate 198:20 211:16 303:17 312:11	evaluated 211:6,13 242:11 294:21 318:19 evaluates 203:16 evaluating 204:7 250:7 evaluation 195:9 197:21 208:25 209:3 212:12 246:23 313:3 everybody 277:20 321:11 evidence 292:7 exact 264:14 313:19 exactly 201:20 283:12 exam 303:21 examination 190:15 194:5 197:4 260:6 287:10 305:22 321:10 examine 199:9 229:5 235:19 317:22 example 195:19 227:7 233:2,7 233:17 234:2,9 245:13 examples 216:11	exceeded 315:23 exceeding 232:24 234:11 except 221:21 excerpt 225:3 excerpts 303:1 excess 315:12 excuse 313:14 executive 193:10 exhibit 196:8 204:19 207:12 208:15,24 209:9 210:15 216:8,22 217:16,20 219:7 225:9,10 227:4,7 236:25 237:4,19 243:12 248:5,6 252:16 253:4 256:25 258:6 259:24,25 272:15 292:15 301:17,22,23 303:18,21 304:18,23 305:16 306:9 306:14,22 308:3 316:6 321:13,14,15 exhibits 300:8 304:9 320:7 existed 285:14
--	---	---	---

[experience - following]

Page 14

experience 269:16,17 270:6 280:23 291:14	facts 317:1 fails 286:13 failure 200:25 fair 300:15,16 fall 237:8 falling 257:23 familiar 205:1 216:24 267:23 268:3 297:20 far 232:5 241:13 255:19 265:17 266:14 266:21 267:3 271:10 272:3 291:13 fed 231:15 feedback 222:17 fiber 232:19,20 233:10,16,16 233:16 234:18 234:18 236:16 238:19 258:25 292:13	figure 220:21 221:1 318:6,10 318:13 figures 220:21 220:21 file 257:7,9 258:6,8,10,16 filter 274:23 275:22 financially 325:12 find 198:24,25 221:2 241:15 242:10 253:5 268:12,14 278:17 285:13 307:11 312:19 finding 235:12 270:22 279:4 fine 197:6 244:16 257:24 260:9 289:17 293:16 305:14 313:6 321:2 finish 203:11 204:3 210:2 230:7 310:8 finished 273:9 first 206:16 217:1 219:17 220:4,8,24 221:25 237:21 244:4,17 245:2 245:14 254:10 254:15 256:24 261:20 263:7	266:11 270:1,7 279:10,15 281:19 287:11 292:18 297:22 297:24 301:11 301:16,18 302:14 305:24 307:6 309:19 311:20 319:12 320:6 323:5 five 248:10 250:18 256:12 259:20 286:17 286:19 flaw 299:4 flip 208:13,18 floor 192:9 flopped 315:21 flopping 316:10 fluid 198:22,23 201:24 203:17 focus 203:8 294:14 focused 244:2 focusing 203:10 folder 256:19 258:16 302:15 follow 204:6 207:21 235:8 277:21 283:6 followed 283:21 following 207:25 211:16 253:4 276:13 276:15 286:6
f	fibers 232:21 233:12,12 238:14,16 fibrils 292:10 fibrous 286:8 field 224:20 243:21 244:2,7 244:18,24 245:12,12,16 246:7,16 247:2 247:8,8,10,13 247:14		
f 191:2 face 286:3 fact 217:14 218:19 232:20 256:11 290:17 294:10 factor 261:7 factors 274:9 276:18,25 277:25			

[following - group]

Page 15

299:23 follows 197:3 foregoing 325:3 forgot 219:6 286:18 form 238:5 240:14,21 279:6 283:7 295:9,10,11,11 295:12 320:9 formal 209:22 320:5 forming 283:19 formula 252:23 252:23 253:5 255:24 forth 255:25 325:7 found 212:8 213:23 236:21 238:3,24 240:13,20 241:18,19 266:21 283:11 313:24 314:5 four 192:12 196:6 304:20 fourth 251:11 fov 247:12 fraction 248:21 248:22 250:13 250:13,15 251:17 fractions 248:15	free 210:25 front 217:17 263:5 284:3 306:20 321:24 322:1 full 208:22,25 225:8,11 247:7 247:10 303:5,5 fully 280:4 320:9 fundamental 296:25 further 248:16 298:21 325:8 g gamma 227:11 227:24 229:23 230:1,2 266:12 287:14,21 288:5 292:11 296:4,17,19 302:16 304:2 310:17 314:25 315:4,12,22,23 316:11 garde 192:11 323:22,23 gateway 192:12 gathered 198:16 gears 292:14 general 268:15 295:10 generate 283:18	generated 261:16 generating 283:22 getting 278:20 give 272:14 278:14 279:5 280:4 288:12 294:8 295:8 306:17 321:6 321:21 323:14 given 227:20 233:10 245:19 246:15 gives 275:2 giving 279:23 282:17 glass 229:7 230:25 231:3,6 231:12,20,20 233:17,20,20 234:1,3 glasses 230:20 230:20,25 231:14,16 go 208:23 210:14 212:3 212:19 229:20 233:25 246:21 252:20 255:7 256:11 258:9 259:15,23 267:22 279:18 292:10 293:15 298:20 299:3 299:11 301:9	306:14,19 313:4 321:9,13 323:5,7,24 god's 209:6 goes 241:14 going 197:14 204:19 216:19 217:16,20 224:23 226:17 227:3 230:20 248:4 252:12 252:13 253:2 255:7 256:6,23 256:24 259:23 271:3 287:2 288:9,11 306:17 312:8 312:17 316:19 good 197:7,8,17 206:13 231:23 240:24 259:15 319:6 grade 238:10 gram 253:15 grams 254:1 grant 215:10 graphic 299:15 299:19 great 197:14 217:19 258:18 306:7 greater 296:19 grid 293:2 grossly 250:17 group 221:14 223:19 224:2
--	---	---	---

[guarantee - identifying]

Page 16

guarantee 276:12 277:16	heavy 248:13 248:21 249:17 250:5,6,12 265:2	howevers 246:22	322:16,23 323:23
guess 228:16 235:10 302:13 303:1,15 304:14,17,19	held 260:5 282:9 313:7	hum 200:14 229:24 230:18 235:21 239:14 240:3	hypothetical 233:14 283:24 316:25
gunter 220:9 221:7 222:4,14	heldrich 191:5	hynes 192:8 194:8 203:11 205:18,21 210:2 220:7 221:23 224:12 233:14 234:23 237:3 238:5 240:14,21 250:25 257:6 265:22 267:10 267:18 269:2 270:4,9 271:15 272:23 275:12 276:14 279:6 280:11,20 281:4,16 282:12 283:7 283:24 284:5 287:3,10 288:15,16 293:17 299:3 300:12,21 301:2,5,8 302:12,20 305:6,10,15,19 308:19 310:24 311:14 313:4 316:25 317:14 319:20 320:23 321:6,9 322:1,8	hypotheticals 291:16
guys 320:3	help 200:1 265:12		i
h	helps 258:19		idaho 221:8
h 195:1 196:1 197:1,1 251:3,4	henrich 193:9		idea 205:14 249:10 264:12 264:23,25 271:1 287:23 317:12
half 262:17,20 262:24,25 263:3,9,13	hercules 249:21 250:4 254:9		identification 195:2,16 196:2 224:24 230:14 270:12,13,14 270:24 317:17
hand 216:19 224:23 228:16 228:18 237:2 283:5	hereinbefore 325:6		identified 294:19 296:12 316:1
handing 208:23 236:24 302:5	hess 266:6		identify 202:3,4 202:9 226:4 229:8 249:8 251:8 273:17 273:22,23 274:14 275:1 276:3 277:3,7 278:6 296:8 299:8 311:22 312:2 315:7
handwritten 196:7 305:16	hess's 265:9,9		identifying 203:19 217:10 286:10
happen 232:22	high 231:22 275:4,19		
happened 280:2 297:5 314:4	higher 229:17		
hard 272:22 307:11	highlight 252:13		
he'll 286:18	hill 193:11		
head 256:5 267:3	history 229:1 280:24		
hearing 287:5	hold 323:9		
heating 221:11	holes 257:20,23		
	hopeful 286:24		
	hotel 191:5		
	hour 263:8,10 263:11 278:20		
	hours 263:16 263:18,19,20 263:21 264:4 264:10		

[identity - informing]

Page 17

identity 244:15	important	incorrect	290:5,18
ii 190:16	197:10 229:19	201:14,17	291:17,20,22
illumination	269:23 276:2,8	204:6 216:15	292:6,11 299:6
218:7 274:4,20	278:2 291:7	241:18 244:8	299:17 303:25
illustrates	impossible	251:12 266:13	308:24 317:4
219:18	244:7	319:13	318:6,11,24
image 195:24	impression	incorrectly	319:11,13,18
196:4 203:16	298:6	204:10	indexes 230:17
220:1 238:8,18	improved	independent	indicate 229:22
241:3 243:19	221:11	261:17 289:22	247:7 249:14
243:21 244:5	inability 243:16	290:8,16	252:2 304:2
244:17,21,22	incapable 284:8	index 194:1	indicated
244:23 245:19	319:16	195:14 198:1,6	260:21 283:16
246:3,14 247:2	incident 231:18	198:14,22,23	indicates
247:6,13,14,15	232:23 233:6	199:8,13,24	284:17
258:5,13	234:10 312:20	202:7 205:24	indicative
261:12	312:23 313:1	206:16,20	228:22 245:11
images 219:25	include 214:5,6	216:13 217:3,7	indices 195:5
221:1 241:24	269:12 277:17	217:15 219:1	204:25 217:12
244:6,19	289:3,7	220:13 227:24	227:11 228:25
247:16,17	included 293:7	228:4,12	301:13
256:20,23,25	includes 209:8	229:15 230:23	individual
316:24 317:13	209:9 214:5	231:1,5,8,11,14	232:19
imerys 243:6	including 202:4	231:22 232:4	individuals
immersed	282:22 320:21	232:11 233:10	231:25
217:4	incomplete	233:13 234:2	industry 252:1
immersion	233:14 278:7	273:24 274:14	inform 312:13
217:4,8 234:3	283:24 284:15	274:14,17	information
imminent	285:18,19,20	275:16 276:5,7	211:20 212:16
224:20	285:23 286:2	277:2,3,12	214:22 215:14
impact 291:16	316:25	278:10 279:13	292:22 293:7
293:11 296:10	inconsistent	279:19 282:21	298:21 299:11
296:11 312:12	237:11,13	284:14 286:10	320:7 323:14
312:14	238:2,23	287:15,24	informing
imperative	240:12,19,25	288:4,4,19,24	215:1
286:7	248:14	289:5,8,14,21	

[ing - know]

Page 18

ing 315:8 initial 222:19 314:11 input 310:7 inspection 293:21 instructions 283:6 instrument 276:22 insulation 212:8 intended 285:13 intensity 274:3 274:20 275:4 275:19,20 276:18 interact 222:1 interaction 223:17 interactions 224:1 interest 225:13 226:8 interested 325:12 interests 243:1 interface 232:21,21,23 232:23 233:5 234:9,19 interim 212:7 internally 232:25	interrupt 288:14 interrupted 278:13 intrinsic 202:5 274:15 291:23 invented 225:18,21 investigator 242:19 involved 242:22 250:5 265:2 involving 270:24 iso 202:8 287:19 289:1,3 289:7 302:9,11 302:19 305:10 isolate 311:23 313:1 isolated 310:21 311:12 312:20 312:23 issue 203:1 229:19 239:10 266:11,14 267:6 313:10 314:3,10 316:15 319:22 issued 200:20 209:22 216:5 295:17 296:20 314:2 issues 197:22 261:4,9 266:21 267:15	it'll 313:6	k
		j j4-1 196:5 273:4 297:16 321:20 jersey 190:2,10 191:4,6 192:13 192:20 193:11 274:17 job 208:2 249:24 283:10 283:13 john 192:11 johnson 190:5 190:5,18,18 192:14,14 251:22,22 279:24,24 280:9,9,18,18 281:1,1,13,13 282:15,15 283:3,3 294:5,5 294:19,19 315:16,16,21 315:21 316:3,3 johnson's 249:11 journal 301:15 julie 242:19,23 242:25 july 191:6 june 223:1,22 259:6,10	kayme 190:14 keep 288:9 kevin 192:8 193:9 237:1 320:20 key 299:5 kind 197:9 257:24 259:3 274:19 296:10 296:11 king 192:8 knew 224:2 300:16 know 201:11 202:16,17 205:25 206:3 206:12,15,21 206:21,22 213:7 216:1 221:21 222:10 222:21 224:9 224:10,25 225:1 229:1 230:14 238:18 242:17,17,18 242:18,21,23 242:25 243:4 244:18,20,24 245:21,22,23 245:25 246:1,6 246:15 249:4 265:23,25 268:17 269:22 273:6 277:8,9

[know - lists]

Page 19

277:11 279:2 280:7 281:11 282:1,2 289:10 289:14 293:3 297:9,10,25 298:3,9,15 299:13 300:6 300:13 317:21 317:23 318:25 321:2,11,24 322:24 323:3 knowing 266:3 knowledge 201:12 known 222:4 289:4,7 318:9 knows 290:9 kotch 193:9	laboratories 218:10 laboratory 207:1,7,23 210:24 212:6 214:3,9 293:25 294:25 297:11 297:12 labs 233:24 lacks 285:16 large 252:24 254:22 larger 237:16 240:1 law 190:10 lay 278:15 leading 288:10 288:13 299:1,2 leave 229:20 252:12 263:3,4 295:6 lee 221:14 223:18,22 224:2 left 228:16,18 263:13 leigh 193:3 length 195:21 236:18 237:5,8 237:16,24 238:21 239:13 239:15,22 240:12 242:11 lengths 236:16 237:7 258:25 259:1	lens 231:17,23 263:25 275:4 letter 213:4 level 253:1 254:12 255:3 275:20 298:15 levy 195:18 226:18,21 227:8,15,16,17 227:23 228:7 228:15,18 229:13 li 309:14 310:15 310:19,25 311:5,10,20 312:19,21 315:6 316:2 li's 295:20,22 296:3,20 311:8 liability 190:8 light 201:10 206:20 224:6 226:5 228:24 230:20 231:4 231:15 232:8 232:12,18 233:3,5,6,11 234:10,10 238:24 248:14 248:22 250:13 250:15 251:16 274:6,19,21 275:5,16,19 276:17 278:11 280:24 284:10 298:16	lighting 261:5,6 261:9 lightly 208:9 line 195:11 198:1,13,21,25 199:1,9,9,23,25 200:3,4 201:1,6 204:8 205:5,16 206:5,8,15,18 215:19,24 216:12 217:2,6 218:6,15,24 220:1,12 221:3 221:9 226:13 235:10 259:24 261:21 262:4,7 263:22,25 264:3 271:12 271:19 272:1,8 286:9 287:4 289:19,22 290:1,8,15,18 290:20 291:4 291:13 306:1 lines 205:5 liquid 218:6 248:13 249:17 250:5,6 265:3 293:4 list 200:22,22 208:25 214:5 275:3 listed 213:11 listen 242:5 lists 210:6,11 228:19
l			
l 190:11 206:25 lab 206:13 209:21 213:12 213:17 214:18 215:1,1,2,4 223:22 233:18 233:25 261:16 264:16 283:17 283:21 295:6 296:9,22 310:9 311:22,25 312:4,13 313:17,24 314:6 labeled 214:2			

[literature - match]

Page 20

literature 202:8 205:13 220:11 274:9 litigation 190:8 little 197:25 258:21 271:3 313:10 livingston 191:5 llp 192:2 locating 229:4 location 308:14 logistic 223:23 long 256:7 262:9,16,21 271:2 306:23 313:22 322:24 323:15 longer 236:17 longo 200:24 201:7,22 203:16 260:12 261:1,11 294:18 306:10 308:17 longo's 235:5 261:16,24 283:17,21 297:6,11 309:6 look 237:6,19 238:19 239:6 239:11,18,23 245:20 247:3,9 254:2 257:4 263:24 272:21 273:2 286:16	302:4 306:19 312:5 316:18 looked 206:9 287:17 317:10 320:6 looking 198:18 203:20 205:6 218:16 230:12 236:6,11,13 244:25 246:16 246:24 258:20 273:6 284:21 285:5 290:3 321:19 looks 302:14,16 304:13,22 320:23 lot 237:7 258:19 315:18 love 238:19 lower 318:23 lunch 321:12	maintain 214:3 maintained 222:18 major 279:15 279:18 296:17 299:4,4 make 202:2,11 209:19 227:5 228:7 231:3,22 250:16 253:2 253:20 256:6,9 257:19 260:13 272:20 279:3 291:4 316:8 317:15 319:17 321:3 makes 217:6 making 316:18 316:18 man 311:9 management 207:23 managerial 207:22,25 manila 302:15 manufacturers 240:5 manufacturing 243:1 manuscript 221:16 223:12 maple 192:19 march 316:5 mark 225:9 245:9 272:13 300:7 304:20	304:20,21,23 305:16 marked 214:13 236:24 245:14 246:25 256:24 292:15 305:15 market 192:3 marketing 190:7 marking 208:23 mas 190:3 207:1,24 209:3 209:17 213:20 215:16 236:20 237:17 241:1 243:25 245:17 246:25 249:12 250:16 252:6 254:18 261:13 268:1 283:11 295:14,16 296:5,14 302:2 303:19 304:1 310:8 311:1 315:12,21 316:6,10 319:10 mas's 214:16 243:15 248:12 293:25 295:25 314:11 match 218:5 234:4 235:13 238:16
	m		
	m 192:18 m1 209:23 m2 209:23 made 295:3 296:11 297:2 304:21 310:16 312:10,15 313:12 316:10 magnification 240:7 258:11 magnitude 218:5		

[matches - microscope]

Page 21

matches 198:21 198:22,25 238:15	197:23 216:3 264:21 266:3 303:11 319:12	meeting 198:16 221:21 222:20 259:6	methododge 277:10
matching 221:10 225:12 225:17 226:3 302:22	mean 208:9 213:4 216:3 222:11 224:13 229:15 252:8 253:20 257:15	meets 213:12	methodology 199:25 203:19 203:22 204:7 214:17 215:24 220:5 297:16
material 210:25 231:19 253:11 270:8 292:4,8 294:8	259:7 262:23 281:18 285:17 300:18 308:21 310:4 312:19 314:3 318:1	mentioned 218:20 261:21 287:12 298:14 308:1	methods 198:10 202:8 212:5 213:1 227:25 289:20
materials 195:15 219:1 256:17 292:23 293:6 295:4 301:14	meaning 252:23 255:24 307:22	mesh 258:3	methvin 193:2
matt 222:19,24 223:6 238:24 251:19	means 211:9 212:1 244:7 247:9 300:1 311:24	mess 228:17	meticulously 221:10
matter 233:15 234:18 244:4 247:14 290:17 294:9	meant 268:17	met 221:25	michel 195:18 226:18,21 227:8,15,16,17 227:23 228:7 228:15,18 229:13
maximum 252:25 255:1	measure 229:3 239:20 244:20 274:16,17 275:15 278:10 279:9	method 196:5 198:1,5,5,7,9 198:12,13 199:23 200:2,7 200:7,9,16,17 201:1,6 205:5 206:4,5 212:6,7 217:6,8,15 218:15 220:12 220:13 226:22 226:25 227:1,2 230:4 233:19 233:24 236:7 261:10 267:24 270:7 274:10 279:10 280:1 288:21 290:9 290:16,16,20 298:7,8,10,14 308:16 309:5 318:2 319:9,10	mickey 221:7 222:14
mccarter 192:11	measured 228:13 292:9 319:18		micrograph 304:1 320:12
mccrone 195:17 224:5,9 224:18,19,24 225:16,18,24 226:11 299:13 299:15,18,25	measurement 232:12 319:12 319:14		micrometer 245:15
mcdevitt 193:9	measuring 276:4 301:13		micron 229:6 229:10 238:25 239:2 245:15
mdl 190:3 192:20 193:5	meet 213:12 218:8 233:18		microns 236:18 237:8,24 238:21 240:12 241:7,7 242:11
			microscope 199:16 218:1 233:1 263:5,16

[microscope - never]

Page 22

274:19 280:25 301:16 microscopist 225:22 243:22 244:25 272:6 microscopists 223:18 276:11 microscopy 201:10 206:20 215:17 224:7 226:5 236:4 254:7 273:12 275:16 278:11 284:10 298:17 322:19 mid 190:11 middle 229:11 241:5 302:19 middlesex 190:10 261:23 miles 193:2 milled 235:16 235:17 mind 253:22 302:3 mineral 202:3 202:4,4 216:14 220:14 229:23 229:25 231:24 232:1 236:6 266:12 269:21 269:24 270:12 270:13,24 273:4 274:16 275:10 278:5 278:10,11	282:22 284:18 289:21 291:20 292:5 299:20 299:20 318:7 318:10,11,17 318:18 322:18 mineralog 284:11 mineralogist 204:20 minerals 195:6 204:25 250:7 269:7,10 270:22 285:8 288:24 290:18 291:24 298:17 304:12 minimum 213:10,12 minus 249:16 minute 230:17 259:20 minutes 286:17 286:19 321:8 321:12 mismatch 218:5 missed 277:5 missing 208:14 208:20 228:9 234:15 276:3 276:25 misstates 221:23 250:25 310:24 311:14 322:8	mistake 296:11 296:12,17,19 296:25 310:21 312:10,14 316:10 319:17 mistaken 221:19 mistakes 316:18,18 mixture 317:10 318:17,19 mixtures 316:16,20 mode 220:22 262:14 263:25 264:3 moment 226:18 318:2 monica 223:22 monitor 237:19 monitored 265:9 monitoring 265:20 montgomery 193:4 month 219:6 monthly 214:4 214:13 morning 260:8 263:10 morpholog 234:19 269:22 269:23 270:17 270:18,25	morphology 286:8 mulberry 192:12 multiples 231:25 myriad 235:4 n n 192:1 193:1 196:1 197:1 206:25 252:23 253:6 255:25 name 214:23 257:7,9 258:6,8 258:10 names 258:16 nature 293:6 need 206:1 271:12,18,25 272:2 277:22 282:1,2 294:13 312:5,11 needed 316:13 needs 218:9 300:19 negative 266:11 neither 325:8 325:11 never 204:2 216:17 222:1 223:7 224:14 227:16 242:20 249:4 251:16 253:22 264:20 285:13 289:11
---	---	--	---

[never - okay]

Page 23

298:7 306:3 308:15 309:4,6 new 190:2,10 191:4,5,6 192:10,10,13 192:20 193:11 274:17 286:25 newark 192:13 nickel 252:7 nine 263:7 nist 289:4,8 nocks 191:2 325:16 non 195:15 219:1 262:14 301:14 nonconformi... 316:1 nonconformity 213:14 296:3,6 296:9 311:24 311:24 312:2,6 312:8,25 313:2 313:13,23 314:4,21,23,24 315:8,8 normal 206:1 290:22 291:9 normally 294:14 north 192:3 note 196:7 noted 299:22 notes 191:1 notice 315:20	number 195:2 196:2 254:22 264:14 297:15 298:5 304:4 numerical 278:5 299:6,17 299:19 nuts 298:16 nvlap 195:8,9 206:24,25 207:7,10,13,22 208:2,5,25 209:22 211:11 211:17,21 212:2,14,15 213:13 214:16 214:20,25 215:8,9,16 233:18 293:21 294:25 295:17 295:23 296:8 297:11 309:13 309:17,19 310:1 312:1,7 312:15,24 314:7,15	object's 279:13 objection 267:18 279:6 280:20 281:4 281:16 283:7 288:9,13,15 299:1,2 322:8 322:16 objections 284:5 317:14 objective 198:20 199:16 200:11 204:1 219:11,15 263:25 300:2 oblique 218:7 observation 213:15 246:25 observe 200:4 276:6 observed 275:24 278:1 observing 200:5 264:6 obtained 221:10 obtaining 279:16 occurred 221:22 october 195:20 237:4 offered 293:15 officer 325:1 oh 236:17 243:4 250:3 262:22	295:5 321:17 oil 217:4 233:4 233:19 234:3 274:1 302:1 ok 211:7,19,25 okay 197:25 198:2,3 199:3 199:11 201:17 202:9 203:24 204:4,17 205:11 206:10 206:18,24 209:2 210:7,10 210:14,18 212:3,4,19,22 213:7,15 214:15 215:9 215:13,21 216:7,9,16 217:19,22 220:18 222:3 222:18,23 223:14,24 225:3,6,16,20 225:23 226:11 226:16,19,20 227:14 228:1 228:10 229:18 230:3,9,16 231:21,24 232:4,11 233:4 233:9 235:3,16 235:22,23,24 237:18 238:20 239:24,25 240:2 241:1,13
	o		
	o 196:1 256:20 o'dell 193:3 oath 197:12 object 236:8 288:12 293:14 299:8 300:15 301:7		

[okay - page]

Page 24

241:20 242:2,7 242:19 243:13 243:14 245:4,7 248:7 249:13 251:15,19 252:6,11 253:18 254:13 254:19 255:8,9 256:6,9 257:20 257:21 258:11 258:14,18 259:12,19,22 259:25 260:1 260:16 261:3,8 261:14,20 262:2,13,15,19 263:15,19 264:8 265:1,8 266:2 267:20 268:11 269:5 269:15,19,25 270:15,21 271:12 272:16 273:1,10,11 275:2 277:15 277:20 278:22 278:24 279:20 280:2 281:10 282:4,19,24 283:1 285:7 286:16,19,20 287:23 288:7 288:25 289:3 289:13,15,16 289:25 290:7 290:24 291:6	291:15 292:20 296:21 297:10 297:25 298:9 298:13,20 299:13,14 300:4,9 301:11 302:12,24 303:4,8,12,24 304:16,19 305:9,18 307:5 307:16 308:1,7 309:24 310:11 311:4,17 312:3 312:7,17 313:11 314:1 314:10,14,17 314:22 316:13 316:14,22 317:8 318:4,7,8 318:16,22 319:20 320:15 320:19 321:9 322:17,20,23 323:6,9 okayed 212:14 212:15 omar 192:2 once 310:8 opaque 195:15 219:1 278:10 290:17 301:14 operator 275:25 opinion 235:15 247:1 261:10 261:17 269:8	270:3,6 273:16 277:7 280:14 282:6,15,17,19 314:18 320:10 opinions 254:16 259:4,9 260:13 260:17,22,22 260:25 261:4 281:11 283:19 320:4 opposed 219:19 244:2 optical 273:12 284:9,11 322:18 options 318:16 oral 190:15 order 200:4 206:8 233:18 236:17 272:6 291:1 outline 279:5 outlined 273:16 281:2 outlining 281:25 outside 207:6 overbroad 220:7 224:12 270:4,9 271:15 275:12 own 245:13 283:19 314:11 317:3	p p 192:1,1 193:1 193:1 206:25 251:3,4 255:25 256:20 p.c. 193:9 p.m. 263:14 286:21 324:1 page 194:2 196:7,13 208:15,17,20 209:9,11 210:5 210:11,14,15 210:16 212:3,3 212:19 213:23 214:12 217:21 218:3 219:9,9 219:22 220:20 221:5 225:4,5,7 237:18,20 238:7 241:2 243:11,12 248:6,8 252:16 252:16,21 253:4 255:21 266:3 272:22 272:25 273:1 284:25 285:5,8 285:10,24 295:18,19 298:24 299:23 302:14,22,24 304:15,17,21 306:16 307:7 307:12,17
---	---	--	---

[page - physically]

Page 25

322:17,18 323:5,8 pages 208:14 208:19 306:23 paginated 217:21 paid 278:20 pandemic 311:21 paper 205:2,4 205:14 218:15 219:8,17,22 221:12 222:3 222:13,15,16 223:9,11 224:16,17 225:24 298:7 301:12 papers 216:10 paragraph 217:1 218:19 225:9,11 248:7 307:7 308:2 309:1 parameter 274:13 parameters 227:21 part 200:7 212:9 249:24 258:23,24,24 265:17 273:3 275:3 276:8 279:15,18 284:4 290:2,9 291:7,8,10	295:23 320:21 particle 198:6 198:14,21 203:17 218:16 225:13 226:8 226:23 228:5 228:13,20,23 229:4 230:13 230:15 232:13 233:22 234:8 235:25 241:22 241:24 242:3 242:14 244:5 244:10,15,15 245:9,14 246:24 247:1,3 247:22,22,25 248:1 257:19 257:23 259:1 274:24 286:10 290:2 316:23 317:3,4,12 particles 201:24 233:21 235:6,13 244:11 247:9 247:21 254:7 293:11 particular 243:10 parties 325:10 pass 211:17 212:2 257:19 260:2 321:5 passed 211:24 214:20 224:21	passes 211:9 past 296:7,10 296:12,15,24 297:1 312:12 pay 307:3,9 308:5 pdf 238:8 241:2 peak 242:1,1 peer 205:13 people 206:12 216:1 229:3 231:21 287:4 percent 213:10 213:12 248:15 248:15,17,18 248:20,22 249:1,5,11 250:11,14,24 252:4 255:1,2 255:19 317:6,7 percentage 253:25 perception 276:23 perfect 254:11 perform 200:10 242:18 254:14 262:3 265:25 266:20 271:19 277:8,10 280:6 284:6 290:10 290:11 298:22 319:10,11,16 performed 201:7 207:2 212:12 254:6	254:15,17 293:5 performing 203:23,25 204:10,14 208:3,4 255:12 284:8 personal 193:12 personally 207:1 211:14 pertaining 197:22 214:17 309:16 petrographic 229:5 petrologist 229:2 230:12 phase 251:2,4 269:21 284:24 phases 249:8,15 photo 246:13 261:15 304:1 photographs 243:20 244:11 248:1 283:18 photomicrogr... 237:21 photomicrogr... 292:21 photos 260:12 260:14 physical 291:23 physically 311:22
---	--	--	--

[picture - pretty]

Page 26

picture 220:9 234:6 237:14 252:14 258:4 piece 199:16 pier 242:19,23 pier's 242:25 pittsburgh 223:2,4,5,8,24 234:6 237:14 238:3 256:18 259:6,11 261:25 262:1 262:12,16 263:6 265:2 place 215:23 325:6 placitella 192:18,18 194:7 209:5 259:17,19 260:1,3,6 267:19 268:7 272:10,13,16 272:20,24 282:10,13 286:23 288:8 297:18 299:1 300:10,14,22 300:23 301:3 304:24 305:4,9 321:7,10,17,21 321:23 plaintiff 292:15 303:22 plaintiffs 190:15 192:4	192:20 193:5 plastic 231:21 231:22 please 201:4 203:5 210:3 240:16 251:6 271:16 284:2 307:4,9 311:17 313:15 321:13 321:22 plm 207:1,2 209:18 214:17 215:17 216:2 218:9 235:5 254:6 271:4,6 271:11 272:6 277:7 281:11 284:4 293:15 294:19 295:11 295:25 297:12 314:20 315:11 315:16 316:6 plotted 241:25 plug 254:23 plus 264:15 302:9 point 197:10 201:16,20 249:7 265:8 314:20 pointing 209:14 polarized 201:10 206:19 224:6 226:5 238:24 274:19 275:16 278:11	280:24 284:10 295:10 298:16 polarizer 198:19 policy 312:16 polycarbonate 231:21 portal 309:19 309:25 310:2,5 310:7,10 portion 258:2 portis 193:2 position 198:17 201:23 250:23 possible 248:21 250:13 post 196:8 304:22 potential 298:21 powder 190:6 247:24 248:2 248:16,19,20 249:1,1,4,9,11 249:15 250:11 250:12,23 251:2,20,24 257:17,25 268:20,22,24 269:3 283:12 294:20 316:3 power 207:7,8 207:11 211:17 powerpoint 237:12 243:11 243:12 252:17	253:5 254:21 practices 190:7 predates 294:4 preparation 248:11,13 250:17 292:23 292:25 293:2 293:10 prepare 259:7 265:13 266:2 prepared 249:17 259:3,9 295:1 preparing 260:11 prerequisite 284:7 prescript 231:17 prescription 231:13 presence 211:1 present 199:12 252:8 306:14 311:22 presented 244:17 298:23 presenting 199:7 presume 206:11 presuming 238:14 pretty 263:8 306:15
--	---	--	--

[previous - question]

Page 27

previous 312:14	281:1 282:1,21 284:12 291:8	proficiency 209:10,16,20 210:12 224:5	publication 224:23 302:17 303:2 305:8
previously 197:2 221:22 318:7	295:23 296:8 299:6,18 312:15 319:16	proficient 209:11,19,21	publish 222:14
primarily 242:15	procedures 210:24 211:3 293:10 294:20	project 223:2,5 223:5,8,25 238:3 249:22	published 204:16,20 206:6 216:10 216:20 218:1
primary 308:24	296:1	250:4,5 254:10 256:18 259:11 270:5	218:23 219:5 219:17 220:6 220:10 226:1 301:15 306:3
principle 228:7 269:18 290:25	proceedings 325:5	promulgated 298:1,4	purposes 250:7
print 208:21 259:23 310:12	process 292:23	property 202:5 274:15 291:23 292:3 308:23 308:24	put 227:3 248:5 253:13 254:21 257:18 258:1 279:5 288:8 302:19 304:22 305:10 323:4
prior 221:23 310:21 311:12 316:5	processes 211:2		
probably 226:19 237:23 242:19 255:1,1 263:7,17 264:5 306:14 315:11	produce 277:2 277:12		
problem 197:18 315:10	produced 248:16 256:17 256:19 257:2 259:5,10 294:18	proposition 228:22	
problems 322:15	produces 248:14	protocol 207:21 207:22 273:5	q
procedure 195:4 204:24 214:25 248:13 254:12 266:1 268:13 273:16 273:19,20 275:17 276:2,5 276:8,9 277:4,5 277:20 278:2,7 278:9,15 279:10,12,21 280:5,10,18	producing 282:21 320:22	provide 200:24 236:4 255:16 256:1 260:13 260:17,22 261:3,10,17 292:22 298:15 302:10 303:21	qa 213:11,11,11 qualified 280:4 qualitative 214:9 quality 212:25 214:4 216:1 quantity 211:1 question 201:2 202:13,15,25 203:9,10,12 204:3 205:9,20 205:22 210:8 222:9 226:2 230:8 240:8,11 240:16 245:2,5
	product 251:8 252:3 270:2 271:7 272:7,7 278:18 283:13 308:23	provided 214:23 215:14 246:4 256:8 292:21	
	production 196:12	providing 223:23 282:5 282:14	
	products 190:6 190:8 193:12 248:16		
	professor 221:7		

[question - refract]

Page 28

253:22 255:7 256:16 267:12 268:2,2 271:16 280:7,17,19 281:3,5,6,15,17 281:19,23,24 282:3,24 283:10,15 289:6 309:9 311:3 312:18 312:22 313:15 314:19 317:9 319:1,5,6,9 322:10,23 323:2 questioning 283:17 293:22 297:22 305:20 questions 203:6 252:22 253:23 260:4 271:4 286:24 287:2,4 287:6 288:10 288:12,13 289:19 293:20 297:16,17 300:15 323:18 323:22,24 quick 262:11 262:13	range 199:6 202:24 234:5 241:16 287:24 304:5,7,10 ranges 289:4,8 ranging 248:15 248:17 rapid 195:3 204:23 rate 213:11,11 214:9 247:6,10 rates 228:24 ratio 239:25 240:1 269:4 ray 267:24 268:1,3,8,11,20 268:21,22,24 269:3,8,25 270:7,17 reach 254:11 read 251:22 253:1 257:6 265:15,17 266:11,15,24 289:11 307:14 reading 230:19 230:20,25 273:9 298:6 ready 259:17 real 197:18 realize 250:16 303:21,22 realized 320:13 really 242:17 250:21 255:7 274:25 278:17	320:16 realtime 191:3 reason 282:2 recall 256:3,5 266:10 267:2,3 267:8,15,20 292:17 293:22 297:17 322:7 323:1 receive 295:1 received 207:9 254:9 receives 294:25 recess 234:24 256:13 286:21 recognize 291:8 recognized 295:18 310:15 recommend 280:9,17,21,25 281:12,18,19 282:2 record 253:2 260:5 264:17 273:3 282:9 288:9 302:13 304:19 313:4,7 321:3 323:25 recross 321:10 red 192:20 233:5 redirect 305:22 refer 216:11 224:15 288:19 291:3 292:6	reference 218:17 224:18 227:19,19 292:8 references 200:22 298:21 299:10 referencing 242:15 referred 225:24 reflected 234:12 reflection 231:9 232:18,22 234:8,15,16,17 reflexion 228:12 refract 199:8 199:12 202:7 205:24 206:16 206:20 217:15 227:24 229:15 231:5,8,11 234:2 274:14 274:14,17 275:15 276:5,7 277:2,3,11 278:10 279:13 279:19 282:21 284:13 288:24 289:14 290:18 291:22 292:6 292:11 299:6 303:25 317:4 319:11,13,18
r			
r 192:1 193:1 256:20 287:18 288:19,21			

[refracted - result]

Page 29

refracted 231:19 232:19 232:25 233:9	260:17 relates 316:15 relationship 222:19,22 223:16 307:22 307:23	252:6,15 254:2 254:3 255:11 255:18 256:18 258:25 259:4,7 259:9 260:11 264:21 266:3 266:10 268:1 283:11,13 287:18 289:1 295:3,7,14,17 295:22 296:4,6 296:20 303:11 303:19 306:8 306:10,22 307:13 308:9 308:14 309:7 309:10 314:1,3 315:2,5,14,25 317:23,24 319:13,15	295:1 297:1 315:12,16,21 316:5,6,10 represented 225:12 226:7 represents 243:21 request 196:12 256:7 294:16 require 254:24 298:16 required 296:8 312:7 requirement 208:1,1 212:1 213:10,13 233:18 311:25 312:1 requirements 210:6 research 254:9 270:5 respected 224:8 224:20 respectfully 280:16 respond 296:6 296:22 312:7 314:6,8 response 296:14 314:11 314:12,16,18 316:1 rest 304:5 result 259:5
refractive 195:5,14 198:1 198:6,13,22,23 199:23 204:24 216:13 217:3,7 217:12 219:1 220:13 227:11 228:4,12,25 230:17,23 231:1,14,22 232:4,11 233:10,13 273:24 286:10 287:14,24 288:3,4,19 289:4,8,21 290:5 291:17 291:20 299:17 301:13 308:24 318:6,11,24 refuse 281:24 refusing 281:22 regard 215:16 286:14 regardless 247:21 253:3 regards 224:5 regular 219:15 regulated 195:6 204:25 reilly 193:9 related 211:3 229:16 260:11	relative 200:25 227:11 243:1 254:6,16 259:5 259:10 309:22 310:16 319:21 325:9,11 rely 224:11,13 283:18,23 remember 219:4 224:17 233:8 240:8 264:14 295:21 296:14 297:2 322:4 remote 311:21 remove 199:18 repeat 267:12 270:24 271:16 284:12 313:14 rephrase 222:12 report 200:19 200:20,24 201:5 207:8 215:5,9,9,11,23 216:3,4,5 236:15 237:6 237:17 247:24 248:7 249:3,12 251:1,2,10	reported 211:21 212:16 237:8,12,22,24 238:9 241:3,5,6 246:3 249:7 253:24 254:1 289:16,17 296:3 318:19 325:5 reporter 191:2 191:3 234:16 reporting 238:20 reports 247:18 248:12 261:13 283:23 294:5	

[resulting - saying]

Page 30

resulting 307:23	rg144 238:9,20	298:24,25	251:13 252:24
results 250:16	rg210 237:22	299:25 300:3	253:6,9,14,15
276:12 296:24	237:22 241:3,5	302:22 303:2,6	253:16 254:4
retained 258:3	ri 307:19,23	303:14 306:23	254:11 257:14
review 200:19	ridiculous	309:2 313:18	257:16 258:1
213:20 215:8,9	250:15,21	313:24 317:25	292:22,25
215:12 221:15	right 199:17,20	318:3 319:4	293:10 294:13
222:6,17	199:21,25	320:18 322:15	297:9 304:4,9
223:13 271:10	200:18 201:16	323:7,24	316:16,19,20
293:25 294:9	201:21 207:18	rj 221:14	317:19 318:9
295:7,24,24	208:7 211:23	223:18,22	sampled 254:3
296:10 297:3,5	212:15 221:4	224:2	samples 212:8
309:13,13,17	222:8 225:25	rls 190:3	218:10 235:12
309:18,20	226:15,21	rock 229:8,9,10	235:14 242:10
310:8,20	228:11,13,17	role 242:25	244:13 248:19
311:10 313:17	230:5,22 231:7	258:25 265:19	250:11 257:25
314:15,17	231:10 236:13	265:20	265:24
315:24,25	238:14 240:4	root 312:10	sanchez 222:19
reviewed	243:8 244:12	roth 192:18	222:25 223:6
205:13 214:22	245:10,24	routine 218:9	223:19,19
215:13 267:25	250:24 252:10	249:24	238:3,24
294:5,18	252:19 258:12	ruled 312:20	240:13,20,23
295:22 315:11	258:17 260:2	run 206:12	240:25 241:14
315:16 316:6	260:25 264:11	214:18	242:16,20,21
reviewer	265:12 268:5	russian 225:21	251:20 262:15
214:24 295:2	268:16,23	s	satisfied 286:9
295:13	270:23 271:23	s 192:1 193:1	saw 214:11
reviewer's	273:15 275:4	195:1 196:1	234:5 238:1,12
215:12	276:10 285:7	197:1,1 251:4	241:9 250:20
reviewing	286:15 287:15	sales 190:7	252:18 275:7
201:25 205:13	288:1,5,20	sample 195:22	295:21 297:21
292:17	289:23 290:5	235:17,17,20	297:24
reviews 311:12	290:12 293:12	237:5 248:11	saying 200:15
rewrite 277:16	293:18,18	248:13 249:18	201:19 204:9,9
278:16 279:2	297:13,15	250:17 251:11	208:22 211:25
	298:11,18,19		213:17 220:11

[saying - sg]

Page 31

228:3 234:9	306:20 307:4	212:10 213:2,3	separate
235:8 239:8	307:10 308:6	214:10 219:11	199:24 200:16
240:15 245:25	screening	220:20 221:17	217:11 221:1
251:3,4 253:14	268:25 270:1,8	224:14 225:8	227:25 230:3
254:23,25	270:11,19,21	225:14 229:11	separation
271:20 275:1	270:23	233:17 237:21	248:13 249:18
307:18 313:12	scroll 238:7	237:25 238:11	250:5,7 265:3
314:18 316:9	se 195:23 196:3	239:22 241:2,8	293:4
318:22	257:12 258:7	243:17 244:5	september
says 211:19	258:13	247:5,13	195:7 207:13
217:1 220:8	search 306:25	248:23,24	294:2
225:16 229:21	second 215:12	250:19 257:24	series 199:5
251:12 273:12	225:8,11	267:5 272:16	204:15 219:25
273:25 275:4	252:19 263:8	272:18,25	248:14 256:22
284:19 296:22	266:14 273:2	273:11 275:6	289:18 292:8
323:11	279:17 294:11	285:2 287:19	292:15
sb 319:2	301:20 302:1	287:23 288:3	serpentine
scale 239:1,1,6	306:17 313:5	295:20 305:4	270:22
243:16 244:7	323:7	308:11 309:18	service 258:4
246:13,14,24	secondary	310:9 317:3	session 303:18
science 232:18	258:13 308:23	320:5,11,16	set 204:18
scientific 318:2	secondly	323:11	208:1 239:21
scientifically	279:12	seeing 205:15	305:16 325:6
228:3	section 209:9	237:7 275:10	setting 198:20
scientist 224:8	210:19,19,23	seems 236:15	199:15 200:1,4
224:20 283:2	212:23 213:23	seen 219:18	200:5,7,8,12,12
scientists	214:2 229:5	230:19 254:5	276:22
223:18 224:1	230:13 232:8	297:6,23 298:8	settings 219:12
screen 227:4	252:15 273:12	selected 243:19	219:19
239:20 244:1	289:11,11	self 201:10	seven 210:17,18
248:5 272:17	sedimentary	sem 237:14,15	272:23
272:18,25	229:9	256:19 258:4	several 217:5
279:24 280:10	see 197:7,8	sense 253:2,20	241:24
280:18 281:14	200:6 202:7	sent 214:25	sg 195:23 196:3
282:11,16	207:15 208:19	222:6,16	258:7
305:13 306:18	209:23 211:4	223:11	

[sg210 - specification]

Page 32

sg210 237:15 237:23 238:10 257:12,13 258:21 292:16 shake 257:22 share 272:17 sharing 282:10 sharp 233:22 sheet 295:21 296:18 304:17 304:21 315:1,5 315:7 sheets 292:16 292:20 296:5 315:9 shifting 292:14 shirley 192:2 shortcomings 260:20 show 213:17 216:11 233:23 241:24 255:11 256:24 305:12 showed 241:16 254:20 317:16 319:15 320:12 showing 273:3 318:23 shown 248:9 293:8 298:24 shu 190:16 194:4 side 228:18 sieve 257:11,17 257:18,20,21 257:21,24	258:2,3 sieved 195:23 196:3 257:9,10 257:10,12,15 258:6 321:16 sieves 257:22 sieving 293:5 sign 218:5 signature 207:17 295:8 325:14 signed 214:23 significantly 221:11 similar 241:18 244:6 247:4 263:8 simple 280:17 281:3,14,17 320:11 simply 246:24 275:1 290:18 single 233:16 233:16,20,22 234:8,18 241:23 292:10 sir 307:3,9 309:21 sit 267:7,14 site 195:8 207:13 295:3 sitting 287:6 size 235:5,13,25 241:13,16,18 241:19,22,24 242:3,14 244:9	244:17 245:9 245:19 246:25 247:1 252:24 253:6 292:4,5 292:13,13 293:11 sizes 241:15 slices 229:10 slide 229:7 243:11,15 253:8,12,16 254:20 255:22 slides 253:14 slip 253:19 slow 255:22 small 236:1 255:3 272:19 smaller 242:1 296:17 software 239:3 240:5 243:25 solid 217:4 218:6 solution 258:2 299:16,19 somebody 205:12 215:13 266:16 280:22 283:3 287:1 sonication 293:5 sorry 204:4 213:23 230:9 251:3 258:23 273:10 311:2 311:10	sorts 294:20 sounds 239:8 soup 298:16 source 234:11 274:7,21 275:5 275:19,20 276:18 287:25 sources 287:18 spalding 192:8 span 248:10 speaking 270:19 spec 275:3 specific 209:17 218:8 247:25 259:10 276:22 276:22,23 298:22 314:21 314:22 specifically 214:15 230:12 specification 273:17 275:9 276:11,13,16 276:16 277:1,1 277:6,17 278:17 279:3 281:2,13 282:6 282:16 283:5,6 283:22 284:1,3 284:14,17 285:1,6,15 286:1,12,13 297:21 299:5 322:14,24 323:15
---	--	---	--

[specificity - summarized]

Page 33

specificity 298:15	234:13 261:7 263:24 264:6	248:9	street 192:3,12 193:4
specified 252:25	266:16,19 273:13,23,25	statement 198:4,8 250:10 286:7 308:15	strike 267:21 271:2
spectra 236:4	274:2,3,4	states 190:1 225:11	structure 236:5 237:14 258:15 269:21 292:1
spectrum 238:15	275:24 276:7 276:19,21	steep 233:22 234:10	stuck 258:21
speculation 205:18 276:14 280:12 283:8 283:25	277:9,14 278:3 279:10,14,17 286:8 289:23 290:1,3,10,11 290:19,21,22	stenographic 191:1	studies 310:22
spend 263:6	291:1,2,3,9,10 291:11,12,18 298:23 299:16 299:21,23	stenographic... 325:5	study 241:21 242:6,6,14,20 242:22
spent 263:15,17 263:19 264:3 322:11	300:1 301:12 302:10 305:3 306:2 322:19	step 215:7,12 270:2,7 277:5 277:19,19,23 277:23 278:2,6 278:15,15	stuff 259:21 305:17
spiked 235:20 241:22 257:13	standard 191:7 229:12 234:25 254:18 256:14 286:22 289:4,8 292:8 293:2 324:2	stick 210:8	su 190:16 194:4 235:2 256:16 260:8 287:6 288:17 301:9 302:16 303:16 305:23 313:9
spoke 267:16		stop 199:19 200:11,12 204:7 219:14 219:14,15,19 219:20 262:14 264:6 273:23 275:23 277:13 277:25 279:9 279:11,14,17 285:25 289:22 289:25 290:3 290:10,11,19 291:1,18 298:22 299:21 300:20 305:3	subdued 307:19
spread 253:16			subsequently 293:12
srm 235:18	standards 207:3 224:6 233:20		substances 317:10
stacked 232:1	standing 288:13,15 321:11		sufficient 273:17
stage 221:11	standout 229:5		suggest 236:15
staining 195:12 198:5,18 199:2 199:4,6 200:1,5 200:6 201:8,14 204:11 205:7 205:16,24 206:1,2,7,9,17 215:25 216:12 217:3,5,11 218:7,8,25 220:13,22 221:9 223:12 224:16 226:12 233:23 234:5	start 203:14 250:22 255:5	straightforward 320:2	suite 192:3 193:11
	state 191:3 218:3 221:6		suites 221:8
			summarize 214:3
			summarized 304:16

[summary - tell]

Page 34

summary 214:13 summation 259:4,9 superb 221:8 superior 190:10 supplemented 264:21 supplied 260:13 260:17,22 support 223:23 suppose 200:12 201:23 240:5 supposed 200:25 234:1,4 312:13 315:7 sure 197:19 234:23 239:8 239:12,17 258:9 271:17 272:2 278:8 279:3 296:25 315:3 316:8 321:3 surrounding 218:6 survived 305:24 switch 198:19 199:8,14 200:11 204:1 204:12 262:14 263:25 314:25 315:13	switched 315:4 switching 199:15 204:7 sworn 197:2 system 213:13 254:13 274:5 275:19 systemic 316:10 t t 195:1 196:1 t'd 196:1 tabbed 321:4 table 248:9 288:22,23 301:25 302:9 302:18 303:1,5 303:6 305:3,7 tables 196:6 302:8 304:20 304:25 tabs 320:20 take 202:22 205:1 208:9 220:9 226:19 234:21 240:4 244:1 252:13 252:19 256:11 258:4 259:20 260:16,21 262:9,21 273:2 286:17,19 302:4 306:19 taken 191:4 216:23 243:19	246:3 247:17 247:20 takes 201:15 talc 195:23 196:3 235:13 236:1 241:23 242:1 243:1 244:14 247:1,3 249:5,11 250:8 250:24 251:9 251:18,20,23 252:3,4,9 257:4 257:12,13 258:7,21 268:12,25 279:4,25 280:10,19 281:3,14 282:17 283:4 285:9,13 286:4 297:9 298:17 316:2,17 321:16 322:6 322:13 talcs 297:7 talcum 190:6 248:16,20 249:1 250:12 talk 197:25 204:16 230:16 242:5 271:3 286:17 318:1 319:21,23 320:3 talked 271:18	talking 199:15 209:7 223:4 247:13 254:7 255:13 285:4 talks 210:23 target 299:8 310:9 task 278:9 283:3 320:11 taught 201:10 technical 207:23 208:1 268:6 282:7 technique 201:14 203:23 203:25 204:11 204:14 205:24 206:16,17,21 206:22 217:7 217:11 236:9 266:1 268:14 268:19,25 269:18,20 270:1 277:9 279:12,14 284:6,8 290:20 293:5 294:10 294:13 301:12 techniques 195:13 218:4 218:25 248:12 tell 197:14 204:13 209:6 224:4 247:6 255:23 258:9 275:17 276:5,9
--	---	--	--

[tell - today's]

Page 35

276:16,17,18	319:21 322:9	302:25 304:13	262:25 264:9
276:20 284:13	325:4	312:11 320:6	295:9 307:1,6
286:18 290:14	testing 209:10	things 214:5	thursday 191:6
300:7	209:16,20,20	251:17 267:8	time 191:7
telling 209:6	209:21,22,23	298:13 299:22	197:12 218:20
307:12	210:4,12 235:5	318:13	220:4,9 221:25
tem 195:20	262:20 267:23	think 201:18,25	229:3 234:25
236:4,7,21	tests 262:3,6	208:14,14	249:23,25
237:4,21 239:4	texas 192:4	213:9 221:25	256:14 260:3
239:5 240:7	thank 220:18	223:1,7,11	260:10 263:6
292:16 293:2,7	240:18 246:11	226:19 227:4	263:21,23,23
293:12 295:12	246:19 255:15	239:21,25	264:3,5,15,16
temperature	258:18 260:9	241:4 247:21	272:17 278:25
274:6,21	309:12 319:7	256:8 258:22	286:22,24
275:18,22	323:19	263:7,9,17	292:18 294:1
276:17	thanks 221:14	268:13 273:19	296:12 297:22
ten 263:8	260:10 287:6,9	288:18,22	297:24 299:17
276:11	thermo 256:20	296:23 297:14	303:19 307:7
term 225:17	thick 229:5,10	298:6 303:13	308:8 320:13
terminolog	thicker 229:16	306:12 311:15	322:12 324:2
232:17	231:3	322:21 323:20	325:6
terrible 316:17	thickness	323:23	timeframe
test 200:8	228:19 229:6,6	thinner 231:23	295:14
209:11 212:5	229:12,14,16	232:8 292:10	times 239:15,18
212:25 262:7	229:17 230:15	third 219:9	239:22 250:1
274:10 281:2	231:19 291:16	251:2,7,10	261:22 307:1,6
319:9,10	291:19 292:4	263:3,9 295:11	308:2
testified 267:9	thicknesses	301:24 303:10	title 209:24
280:23	228:23 230:17	312:11	247:23 284:24
testifies 197:2	thin 230:13	thought 221:19	285:1
testify 256:8	thing 208:22	225:20,25	titled 207:13
266:6	220:23 224:14	thousands	today 260:8
testimony	247:7 254:10	250:2	267:7,14
221:24 250:25	271:24 284:22	three 218:4	287:12 293:8
261:14,24	287:11 296:9	219:11,18	today's 292:18
310:24 311:14	301:16,20	220:22 221:1	297:22 300:5

[today's - use]

Page 36

300:13 together 203:17 259:21 263:1 302:21 319:21 told 248:25 249:1,3 took 234:6 237:14 252:8 253:15 302:16 305:7 tool 270:11,19 270:21,23 top 207:13 218:3 232:1 235:10 237:23 244:5 275:2 284:25 285:2,4 285:8 topics 226:15 total 214:9 234:8,15 244:24 253:9 253:11 254:1 totally 232:25 233:9 234:12 266:13 304:3 traffic 286:25 trained 205:25 206:3,12,14,15 206:19 290:9 290:24 transcript 191:1 265:15 266:15,25 267:4,5 301:21 306:9 325:4	transcripts 265:18 transmission 236:3 travel 264:15 tried 250:18 true 198:4,8 199:1,7,12 236:6 242:3 246:12 269:10 286:4 288:3,4 290:24 291:2 291:19 308:14 325:3 truly 235:11 284:9 trust 239:3 267:4 trusting 239:6 239:9 truth 197:15 try 210:8 229:8 258:4 313:23 321:12 trying 203:15 226:4 256:9 271:24 317:7 turn 215:5,19 217:21 219:9 221:5 225:4,4 255:2 263:24 314:10 turned 300:25 tutorial 204:12 twice 200:21 209:22 307:7	two 216:13 227:22,25 241:25 244:6 245:12 247:2 247:16 250:1 250:15 262:17 262:19,24 266:21 267:8 267:14 279:15 287:7 291:13 292:3 294:10 294:12 300:19 301:25 308:2 316:16,20 318:16 319:1 321:12 type 229:9 268:9 types 294:17 typical 233:4 typo 237:23 241:4 u u 197:1,1,1 um 200:14 229:24 230:18 235:21 239:14 240:3 unaware 243:24 uncategorized 318:7 under 197:12 198:19 214:8 237:8 242:11	253:11 263:16 273:11,11 290:3 understand 197:11 202:6 215:22 224:19 227:17 228:1 242:9 244:10 265:20 272:4 283:9 284:9 311:2 313:9,16 313:23 317:6 understands 290:25 understood 197:13 310:14 undertaken 242:15 unification 195:11 218:24 uniform 229:6 234:1 united 190:1 university 221:8 unrelated 230:2 use 200:25 206:4,22 210:24 212:6 230:19 231:21 233:19 234:3 241:23 255:12 257:21 260:12 262:7 263:22 268:11,24
--	--	--	--

[use - way]

Page 37

274:19,20,22 275:20,21,22 279:25 280:9 280:18 281:1 281:13 282:16 290:4 291:13 299:18 311:23 311:23 used 217:3 227:15,16 233:24 243:4 255:4,24 256:4 258:24 261:11 266:20 268:8 269:9 270:1 271:5 286:2 293:5 297:13 297:14 302:2 322:5,12 323:16 uses 290:1 using 199:25 201:13 205:5 205:23 206:19 217:8 229:12 248:11 253:7 254:17 257:17 271:5 275:8 277:7 280:24 289:21 306:1 usp 241:21 242:6,6,14,20 242:22 utilize 204:1 220:11 226:12 246:13	utilized 239:3 243:25 247:16 utilizing 200:16 201:6 v v 190:16 206:25 vague 220:7 265:22 269:2 270:4,9 271:15 275:12 278:8 280:11 298:6 valid 270:7,21 validation 212:6 value 196:13 255:25,25 278:5 290:5 292:11 299:19 303:25 304:2,2 304:5 307:19 307:20 315:22 315:22 317:4 318:24 321:1 values 228:19 255:11,23 256:4 287:15 287:24 288:19 289:5,8,21 291:17 310:17 315:13 variable 255:11 variables 255:24 variation 275:23	various 221:9 228:23 248:11 versatile 217:6 version 323:15 versus 241:23 291:2 vertical 228:16 vibration 257:22 videotape 264:23 view 224:4 243:21 244:2,7 244:18,24 245:12,12,16 246:7,16 247:2 247:8,8,10,13 247:14 viewed 227:20 247:25 visit 294:21 295:4 visual 246:2 visualization 245:18 visually 238:16 241:10 volcanic 229:9 volume 190:16 w w 190:14 walk 301:5 walter 195:17 224:5,24 299:25	want 197:25 202:11,13 204:16 208:21 215:19 242:5 243:10 248:4 252:19 255:5 265:23,25 272:16,22 279:2 282:22 294:14 300:6 301:7 306:14 313:9,16,22 316:8 321:3 wanted 278:17 287:11 wanting 318:6 water 257:18 257:19 258:1 wavelength 202:17 225:12 225:17 226:3 232:25 233:7,9 234:12 302:18 wavelengths 202:19,21,24 202:25 221:10 234:15 way 204:14 206:18 209:6 209:17 214:17 225:9 227:18 227:22 238:25 252:14 275:13 276:12 282:3 282:25 283:16 286:2 290:2
---	---	--	---

[way - zoom]

Page 38

292:1 299:7 304:9 323:12 ways 203:24 204:5 207:2 216:13 wearer 231:23 week 221:20 222:20 weight 253:19 253:25 went 261:23,25 262:1 293:25 322:5 wet 195:23 196:3 257:9,12 257:15,17,23 258:1,6 293:5 321:16 widely 233:24 width 239:11 239:16 245:14 246:3,14 wish 237:20 260:7 witness 194:3 205:19 260:3 272:14,21 287:9 288:11 305:12,18 308:18 320:25 321:5 witnessed 261:24 woman 311:5,8 word 200:20 306:25,25	307:8 308:1,13 work 206:24,25 216:18 222:22 224:11,14,15 237:13 243:4 264:9 265:2 295:24 296:10 296:12 297:12 worked 222:13 222:24 223:6,9 262:24 working 222:18 222:22 223:16 223:21 249:21 254:8 264:10 264:16 283:2 world 248:25 wrest 267:5 write 218:14 226:11 277:19 279:21 310:7 320:25 written 285:12 286:1 wrong 201:19 201:20 202:1 203:22 250:17 266:17,22 294:24 297:2 303:22 307:19 wrote 218:11 222:16 226:9	267:24 268:1,3 268:8,11,20,21 268:22,24 269:3,8,25 270:7,17 x100157300 325:16 xi01573 191:4 xr00011300 325:17	year 209:22 218:23 248:10 259:6 298:3 323:3 years 221:22 222:5 250:4,18 269:16 280:24 298:5 yep 209:12 214:1 yesterday 320:6 york 192:10,10
		y	
		yeah 201:12 202:20 204:22 205:21 207:16 208:8 209:1,11 213:15 217:23 225:2 228:2 240:10 242:8 243:9 247:19 251:5 257:9,13 262:1 263:2 272:15,21 273:1 278:19 285:10,19,23 288:22,23 290:15 295:21 301:18,24 302:7 303:7,10 303:17 304:16 304:18 305:6,7 305:21 308:19 309:15 312:15 313:16 320:8 320:19	z
			zoom 192:19 193:3,10
	x		
	x 195:1 196:1 228:16,17		

Federal Rules of Civil Procedure

Rule 30

(e) Review By the Witness; Changes.

(1) Review; Statement of Changes. On request by the deponent or a party before the deposition is completed, the deponent must be allowed 30 days after being notified by the officer that the transcript or recording is available in which:

(A) to review the transcript or recording; and

(B) if there are changes in form or substance, to sign a statement listing the changes and the reasons for making them.

(2) Changes Indicated in the Officer's Certificate. The officer must note in the certificate prescribed by Rule 30(f)(1) whether a review was requested and, if so, must attach any changes the deponent makes during the 30-day period.

DISCLAIMER: THE FOREGOING FEDERAL PROCEDURE RULES ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY.

THE ABOVE RULES ARE CURRENT AS OF APRIL 1, 2019. PLEASE REFER TO THE APPLICABLE FEDERAL RULES OF CIVIL PROCEDURE FOR UP-TO-DATE INFORMATION.

VERITEXT LEGAL SOLUTIONS

COMPANY CERTIFICATE AND DISCLOSURE STATEMENT

Veritext Legal Solutions represents that the foregoing transcript is a true, correct and complete transcript of the colloquies, questions and answers as submitted by the court reporter. Veritext Legal Solutions further represents that the attached exhibits, if any, are true, correct and complete documents as submitted by the court reporter and/or attorneys in relation to this deposition and that the documents were processed in accordance with our litigation support and production standards.

Veritext Legal Solutions is committed to maintaining the confidentiality of client and witness information, in accordance with the regulations promulgated under the Health Insurance Portability and Accountability Act (HIPAA), as amended with respect to protected health information and the Gramm-Leach-Bliley Act, as amended, with respect to Personally Identifiable Information (PII). Physical transcripts and exhibits are managed under strict facility and personnel access controls. Electronic files of documents are stored in encrypted form and are transmitted in an encrypted

fashion to authenticated parties who are permitted to access the material. Our data is hosted in a Tier 4 SSAE 16 certified facility.

Veritext Legal Solutions complies with all federal and State regulations with respect to the provision of court reporting services, and maintains its neutrality and independence regardless of relationship or the financial outcome of any litigation. Veritext requires adherence to the foregoing professional and ethical standards from all of its subcontractors in their independent contractor agreements.

Inquiries about Veritext Legal Solutions' confidentiality and security policies and practices should be directed to Veritext's Client Services Associates indicated on the cover of this document or at www.veritext.com.